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Final Environmental Impact Statement

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Shoshone National Forest, Park, Fremont, Sublette, Teton, and Hot Springs Counties, Wyoming

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Shoshone National Forest Land Management Plan Revision
Final Environmental Impact Statement
Park, Fremont, Sublette, Teton, and Hot Springs Counties, Wyoming

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Abstract: This final environmental impact statement (FEIS) documents analysis of seven alternatives developed for programmatic management of the 2.4 million acres administered by the Shoshone National Forest. The Forest Service has identified alternative G as the preferred alternative.

The announcement of the release of the final plan and this final environmental impact statement will be published in the Federal Register. This will be followed by a 60-day objection period. To qualify for

"standing," objections must be linked to a prior substantive comment submitted during opportunities for comment on the proposed decision. Objections will be resolved and/or responded to within 90 days following the 60-day objection period. The Record of Decision for the revised Forest Plan will not be issued until the reviewing officer has responded to the objections.

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Introduction

The major goal of analysis is to provide enough information to help decision makers and the public understand trade-offs between alternative management scenarios. Information also helps determine which combination of goods, services, and land allocations will maximize net public benefits. The regulations at 36 CFR 219 (1982 regulations) developed under the National Forest Management Act (NFMA) provide the analytical framework within which these decisions are made.

For the Shoshone National Forest plan revision a geographic information system (GIS) was used to develop the forest plan revision database. The database stores information about features located on the landscape, ranging from natural features such as rivers and vegetation types to constructed features such as roads and campgrounds. Legal or administrative boundaries such as the Forest boundary, research natural areas (RNA), and wilderness boundaries are also part of the GIS database. The database was used to analyze suitable timber lands, rangelands, describe the existing resource conditions, and perform other analyses for the revision.

1986 Forest Plan Management Area Adjustments

Management areas developed in 1986 for the current forest plan were mapped manually. Once the Shoshone acquired GIS in the early to mid-1990s the hard copy management area map was digitized and added to the GIS database. As part of the plan revision, that layer has been updated to correct spatial errors or to reflect changes to the forest plan since 1986. The following changes were made to the data.

Clarks Fork Wild River Corridor

The Clarks Fork Wild River management area (10D) was changed to match the official boundary as designated by legislation. Adjacent management areas were adjusted to match the official boundary.

High Lakes Wilderness Study Area

The High Lakes Wilderness Study Area management area (10E) was changed to match the legislatively defined boundary. Adjacent management areas were adjusted to match the official boundary.

Dunoir Special Management Unit

The Dunoir Special Management Unit management areas (10F) were digitized using 1:24,000 topographic maps to make the lines more accurate.

Line Creek Plateau Research Natural Area

Line Creek Plateau Research Natural Area (RNA) management area was added to the forest plan management area map. The RNA was established in 2000 in a forest plan amendment. The portion of the RNA that falls outside of the High Lakes Wilderness Study Area was digitized and assigned a new management area number (10ALC).

Swamp Lake Botanical Area

Swamp Lake is the only existing special interest area (SIA) on the Shoshone. It was officially designated in a forest plan amendment in 1987 and was not included on the 1986 Forest Plan management area map. The SIA boundary was digitized and added to the management area maps and given the management area number (10G) assigned to it in the plan amendment. Adjacent management areas were adjusted to match the boundary.

Kirwin Historical Area

In 1992, the Shoshone acquired Kirwin, an old mining town from the late 19th to early 20th century, when the Richard King Mellon Foundation and the Conservation Fund purchased it from the American Metals Climax Mining Company and donated it to the Forest. A forest plan amendment in 1995 established a management area (10H) for the Kirwin property. The boundary was digitized and added to the management area map. Adjacent management areas were adjusted to match the boundary.

Forest Boundary Changes

In 2011, the Shoshone received a land donation on the Wind River Ranger District which was incorporated into the surrounding management areas. This added to the National Forest System (NFS) lands northwest of Dubois, Wyoming.

Timber Inventory data

Three sources of inventory data were used in the timber analysis. Inventory data are the source for the utilization standards and volume equations used in the analysis. Inventory information for estimating stand characteristics and volumes was obtained from the Forest Inventory and Analysis data and from the Shoshone's common stand exam data. Forest Inventory and Analysis provides a statistically based sample of forest resources across all ownerships that can be used for planning and analyses at local, state, regional, and national levels. Summary documentation of the Forest Inventory and Analysis data for the Shoshone is provided in Forest Resources of the Shoshone National Forest (USDA Forest Service 2008). An additional source of information from the Shoshone's common stand exam was used to supplement the Forest Inventory and Analysis inventory data. These data are available electronically within the Forest's FSVeg database.

Vegetation mapping for the Shoshone was derived from the R2Veg database.[1.] R2Veg is the Rocky Mountain Region's corporate vegetation database. It consists of existing vegetation data in a spatial layer and a series of tables containing vegetation attributes. The spatial and tabular components are housed together in an ArcGIS geodatabase. R2Veg data were captured as part of the Integrated Resource Inventory effort using a combination of photo interpretation and field verification. Information was recorded at the basic level of life form or ground cover (tree, shrub, grass, forb, barren, or water), species, size, and density (USDA Forest Service 2005, USDA Forest Service 2008a).

Update to R2Veg Vegetation Database for Plan Revision

The Forest GIS vegetation database (R2Veg) was fundamental to several analyses performed for the Plan revision effort. Although it is updated every few years to reflect changed conditions, there were inaccuracies that had to be updated immediately to more realistically represent conditions on the ground. No changes were made to the vegetation database between draft and final. No vegetation inventory was conducted and no significant wildfires occurred. The current database is representative of forest conditions and is adequate for making the needed alternative comparisons. Changes made (see table 1) address the following situations.

Wildfires

Cover type and structural stage were updated to reflect changes to stands resulting from recent wildfires (Gunbarrel, Hole in the Wall, Warm Springs, Norton Point and Castle).

[1] In 2011, R2Veg data were moved to a new database called FSVeg Spatial. For the revision process, the data are being used in the R2Veg format before being transferred.

Regeneration Cover Types

Forested stands that were burned or where insects killed the overstory were erroneously classified as grasslands or shrublands, based on the fact that the majority of the vegetation was grass or shrubs at the time of inventory. Information in the database indicated that the stands previously contained trees. The majority of these stands will transition back to forested vegetation over time, so they should be classified as forested cover types with a current structural stage of grass/forb or shrub for modeling purposes. The vegetation database was adjusted to reflect this.

Alpine versus Grasslands

There was a need to split out alpine habitat from grasslands. This was accomplished using the alpine soils GIS layer to identify grasslands characterized by alpine vegetation. A small amount of willow habitat was also placed in the alpine group. Alpine grassland has a structural stage of grass/forb and alpine willow habitat has one of seedling/sapling. Not all alpine habitat was split out because a majority of the high-elevation sites are classified as rock and/or ice.

Table 1. Acres changes resulting from database update of vegetation data

Cover Types	Acres Prior to Update	Acres after Update	Change
Alpine		300,647	300,647
Aspen	27,669	27,792	123
Douglas fir	314,520	355,789	41,269
Grasslands	977,974	518,783	-158,545[2]
Limber pine	38,251	39,167	916
Lodgepole pine	269,033	389,133	120,101
Non-vegetated	332,368	328,170	-4,198
Other tree	4,760	4,786	26
Sagebrush	52,149	49,955	-2,193
Spruce/fir	331,682	315,986	-15,696
Water	16,363	16,363	0
Whitebark pine	174,033	192,682	18,649
Willow	15,825	15,374	-451
Totals	**2,554,626**	**2,554,626**	

Forest health (insect and disease)

Information on forest health used in Plan revision was summarized from aerial and ground observations by Region 2 Forest health protection staff and Region 2 state partners. Aerial surveys are conducted annually, primarily over western conifer and aspen forest. Aerial surveys can detect faded foliage caused by bark beetle attack, needle or leaf loss or discoloration caused by defoliating insects, wind thrown trees, and in some cases, fungi or abiotic factors. Ground surveys constitute a broad range of observations in rural and urban forest environments throughout the region. Data used in plan revision include aerial surveys conducted through 2011.

[2] The acres of alpine and grassland habitats were combined to estimate the change in grassland cover type.

Due to the nature of aerial surveys, data will only provide rough estimates of location, intensity, and the resulting trend information for agents detectable from the air. Data presented should only be used as a partial indicator of insect and disease activity.

Aerial surveys were conducted in 2012 for the forest. That latest information was not incorporated into the analysis between draft and final. It was determined that the existing vegetation dataset was adequate to analyze differences among alternatives and inform the decision maker. Any changes to the database would have required many of the vegetation-related analyses done for the EIS to be redone. The benefit of redoing the analysis versus the time and cost of redoing that work was not deemed favorable. More accurate information may be necessary for a site-specific analysis, but for an analysis at the forest scale the differences are not significant. The additional acres identified in the 2012 aerial survey amount to approximately 14,000 acres across the whole forest.

Insect epidemic information used in spectrum analysis

One of the land stratification identifiers used in the spectrum model was whether the land had been impacted by the insect epidemic. This was used to determine whether to assign a yield table that had been modified for bug impacts. Because of the nature and accuracy of the aerial survey data as compared to the vegetation database, there is not good correlation in the accuracy of mapping and polygon boundary locations. In general, the aerial survey mapping is less spatially accurate than the vegetation data. This is not a limitation when the aerial survey data is for the primary purpose of identifying trends from year to year. It is a limitation when there is an attempt to combine the aerial survey information with more accurate stand data.

This issue was addressed by using the stand data as a controlling layer in combining the two data sets. Basically the bark beetle information was extracted from the aerial data and was overlaid with the conifer stands from the vegetation layer. Any aerial data that fell outside of a conifer stand was dropped. There was also no attempt made to match up the cover type classification from the aerial data with the vegetation data. The aerial data were strictly used to identify whether there was an impact from the epidemic, regardless of tree species.

The resulting information has a lower estimate for total acres impacted from the epidemic on the forest, but still indicates a significant impact to the timber base (more than half the base impacted by insects), and the interdisciplinary team felt the data were appropriate for comparing effects across alternatives. The acres are not intended to provide an estimate of total impacts and should not be used for that purpose.

Range Capability and Suitability Evaluation

The requirement to perform analysis of rangeland suitability is found in the NFMA at 36 CFR 219.20. The process followed on the Shoshone National Forest is based on Region 2 direction. This analysis focused on those environmental components that had the greatest effect on range suitability and were most important for comparison among alternatives. Items that did not vary by alternative and had a similar effect in all alternatives were not included. For example, range capability was not reduced by calculating the acreage that occurs on road surfaces. That number is relatively constant across the alternatives and does not provide information that is important for the decision-making process. Those types of site-specific components are addressed during project-level allotment management planning.

Rangeland Capability

The definition of rangeland capability found in 36 CFR 219.3 (1982 regulations) follows:
Capability – The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management

intensity. Capability depends upon current resource and site conditions such as climate, slope, landform, soils, and geology, as well as the application of management practices, such as silviculture or protection from fire, insects, and disease.

Process for Determination of Rangeland Capability

The Forest GIS and the most current available data were used for the following analysis.

1. Begin with all NFS lands.
2. Areas that are dominated by a large percentage of rock, barren ground, and generally non-vegetated ground were subtracted. Water in the form of lakes and ponds was also subtracted at this step.
3. Slopes greater than 60 percent were subtracted. These areas are identified as not suitable for cattle and sheep grazing. In the DEIS analysis, the 40 to 60 percent slope range, which is generally suitable for sheep grazing was identified as not being capable. Most of the Shoshone is not available for sheep grazing and the interdisciplinary team felt the information on capability for sheep was not needed by the decision maker. Sheep are only grazed on two allotments on the south end of the Forest and the terrain is generally less than 40 percent slopes in those areas. Comments received on the DEIS objected to this approach. They felt it did not follow standard protocols and provided in incorrect display of grazing capability. Based on the comments, we reconsidered our approach and adjusted it to include the 40 to 60 percent slope range as capable acres. Now they are not removed until the suitability screen where suitability for cattle grazing is determined.
4. The remaining acres are generally capable for grazing.

Rangeland Suitability

The definition of suitability found at 36 CFR 219.3 (1982 regulations) follows:

> Suitability – The appropriateness of applying certain resource management practices to a particular area of lands, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.

Rangeland suitability varies by alternative or grouping of alternatives.

Process for Determination of Rangeland Suitability

1. Unusable areas identified in the capability analysis were subtracted.
2. Acres with slopes 40 to 60 percent slope were subtracted as not being suitable for cattle grazing.
3. Acres that have an over story or tree canopy cover were subtracted. Transitory range is normally only considered for a short time when conditions favor the production of sufficient understory vegetation. To simplify the analysis, cover types for lodgepole pine, Douglas-fir, and spruce/fir were subtracted at this stage, based on the assumption that the desired condition on those areas was a fully stocked timber stand that would limit understory vegetation. Other cover types (aspen, whitebark pine, limber pine) were not subtracted because they generally occur in less dense stands or provide conditions that support understory vegetation that provide forage.
4. Acres that occurred outside of existing allotments were subtracted from all alternatives except for alternative F. These are areas where management area prescriptions do not support livestock grazing. They include areas like wilderness that have never been grazed and other areas where grazing has not occurred because of limited forage. Management activities have not supported grazing in these areas.

All of the areas outside of wilderness that had some forage potential were included in alternative F to provide an opportunity for evaluation.

5. In alternative F, some of the acres in new allotments occurred in old sheep allotments that were not restocked with cattle because of their general unsuitability for cattle grazing. To better represent that situation in the analysis, acres classified as alpine within old sheep allotments were subtracted from alternative F.
6. One of the design criteria in alternative C was for no cattle grazing on bighorn sheep and elk crucial winter range. Those acres are subtracted in alternative C.
7. The remaining area is generally suitable for grazing.

Forest Plan Suitability Determination

For forest planning purposes, the combined "capability" and "suitability" analysis constitutes a suitability determination. The capability and suitability analysis, and resultant suitability determination is not a decision to graze livestock on any specific area of land, nor is it a decision about or estimate of livestock grazing capacity. The capability/suitability analysis and suitability determination may or may not provide supporting information for a decision to graze livestock on a specific area.

Any landscape area will contain areas that are capable and/or suitable as well as areas that are modeled as being other than capable and/or suitable. Since the forest plan-level suitability determination is based on a modeling process, and is dealing with a variety of complex landscapes, it is inevitable that this intermingling will occur on a land base of any significant size. Therefore, these suitability determinations are not intended to imply that livestock will be precluded from being found on lands that may be modeled as other than capable or suitable.

At the forest plan level, the suitability determination provides basic information regarding the potential of the land to produce resources and supply goods and services in a sustainable manner, as well as the appropriateness of using that land in a given manner. This information assists the interdisciplinary team and the line officer in evaluating alternatives and arriving at forest plan-level decisions. It also helps with an analysis of alternative uses foregone.

Lands Suitable for Timber Production

The timber suitability classification for the Shoshone was accomplished by applying planning regulation criteria (36 CFR 219.14 1982 regulations) in a step-wise process. Forest-wide geographic information system data were used to analyze and map the classification. Ranger district timber personnel reviewed the results and adjusted criteria to reflect on-the-ground experience. The process and rationale are described below.

Identification of Lands Generally Not Suitable for Timber Harvest

Criteria for determining lands generally not suitable for timber harvest are outlined in 36 CFR 219.14 (1982 regulations). Lands generally not suitable for timber harvest are those where:

1. Statute, executive order, or regulation prohibits timber harvest on the land, or the Secretary of Agriculture or the Chief of the Forest Service has withdrawn the land from timber harvest.
2. At the broad forest scale, the responsible official estimates that soil, slope, or other watershed conditions will be irreversibly damaged by timber harvest.

3. At the broad forest scale, the responsible official estimates there is no assurance that such lands can be adequately restocked within 5 years after harvest.
4. Trees are unable to grow due to environmental conditions (such as insufficient rainfall, low temperature, or other growing conditions preventing the establishment of tree cover).

Under criterion 1, areas were identified as not suitable for timber harvest. These included designated wilderness, the Dunoir Special Management Unit, and High Lakes Wilderness Study Area. The Glacier Addition to the Fitzpatrick Wilderness is not included with this group. The wilderness designation for that area allows timber harvest for bighorn sheep management.

Criteria 2, 3, and 4 are considered together because there is overlap between data used to screen for the criteria. Table 2 displays lands excluded from timber harvest and the criteria under which they fall.

Table 2. Areas where irreversible damage, adequate restocking, and other environmental conditions make the area not suitable for timber harvest

Land conditions	Criteria rationale
High elevations above 11,000 feet	Adequate restocking and environmental conditions
Low elevations and southwest aspects[3]	Adequate restocking and environmental conditions
Slopes greater than 40 percent	Irreversible damage
Areas of water, rock, or barren	Environmental conditions

Identification of Lands Generally Suitable for Timber Harvest

All lands that do not meet the criteria described above were identified as lands generally suitable for timber harvest.

These lands include:

1. Lands where timber production achieves or is compatible with the achievement of desired conditions and objectives established by the plan.
2. Other lands where harvest for multiple-use objectives other than timber production, including salvage sales, may take place.

Timber Production Achieves or is Compatible with Desired Conditions and Resource Objectives

This category includes lands where:

1. Timber production would either (a) achieve, (b) be compatible with, or (c) could contribute to, the achievement of desired conditions and resource management objectives , and
2. A flow of forest products can be planned and scheduled on a reasonably predictable basis over time.

[3] Elevations were adjusted by ranger district from north to south to reflect on-the-ground experience (Clarks Fork Ranger District below 7,200 feet, Greybull and Wapiti Ranger Districts below 7,600 feet, Wind River Ranger District below 8,000 feet, and Washakie Ranger District below 8,400 feet). These numbers are still being fine-tuned.

On these lands, timber production may be a primary multiple-use resource objective. In many cases, timber production may be secondary to other multiple-use resource objectives. If meeting desired conditions and resource objectives would achieve or be compatible with producing commercial timber products over time, and those products can be planned and scheduled on a reasonably predictable basis, the land should be identified as generally suitable for timber production. An important factor in determining whether desired conditions and objectives are compatible with timber production is whether regeneration of the stand as an element in maintaining the desired conditions of forest vegetation is planned at any time in the future. If regeneration is not planned at any time in the future, those lands are not included in this category. The identification of lands generally suitable for timber production as one of the management objectives is not a final decision approving projects or activities.

For the Shoshone, lands within Management Area (MA) Category 5 were included in this category, excluding those lands that meet the criteria described in the next section.

Other Lands where Timber Production is not Compatible with Desired Conditions or Resource Objectives

Special areas and proposed special areas were identified where the desired conditions are not compatible with timber production. These include the designated Clarks Fork Wild and Scenic River segment, Line Creek Plateau Research Natural Area, and proposed research natural areas and special interest areas.

On some lands, timber production is not compatible with the resource objectives. Those lands are described in table 3.

Table 3. Lands where resource objectives are not compatible with timber production

Lands description	Rationale
Cover types of aspen, cottonwood, pinyon	Resource objectives are to maintain these cover types. These are not commercial timber species.
Cover types of whitebark pine or limber pine	Pure stands of these species are not compatible with timber production. They do not generally produce marketable products in pure stands. This does not apply when they occur in mixed stands with other conifer species.
Cover types of grasslands and shrublands	Resource objectives are to maintain these cover types.
Moraine soil type (in the Washakie geographic area)	Highly rocky soils are not compatible with timber production.

On some lands, the desired conditions for management areas proposed in Plan revision are not compatible with timber production. These include all management areas in categories other than 5, including management areas MA 4.2 Scenic byways, scenic areas, vistas, and travel corridors and MA 4.3 Back country access corridors. In addition, any lands in inventoried roadless areas in alternatives B, C, D, and G are not compatible with timber production. Harvest in those alternatives is restricted due to the reasons identified in the 2001 Roadless Area Conservation Rule.

Suitable timber acres for alternative A

The timber suitability determination is a forest plan decision and is only changed by a plan revision or amendment. The current suitable timber for the existing plan is 86,300 acres. This acreage has not changed since the 1986 Forest Plan was first signed, though the 1994 amendment that lowered the allowable sale quantity (ASQ) did attempt to map the location of the acres. The accuracy of that map was limited by the technology and information available at that time. In this DEIS, suitable acres are reported

as 86,300 for alternative A, but it was felt that using this number for analysis of effects would skew the relative comparison with the other alternatives.

To address this information, the suitable acres for alternative A were remapped using the same process used for the action alternatives described above. The existing forest plan management area allocations were used in that process. This remapping resulted in 107,000 acres of suitable timber land. These acres were used in the analysis process. It is felt that this gives a more appropriate comparison across the alternatives and does not change alternative A's relative ranking on number of suitable timber acres across the alternatives. If alternative A is chosen as the preferred alternative in the final decision, this mapping of the suitable acres will be established as the suitable acres.

Timber Yield Table Development

Timber yield tables used in the analysis were developed using the Forest Vegetation Simulator (FVS). The FVS is a forest growth and yield model designed to forecast forest stand development from stand inventory data. The FVS grows individual forest stands into the future with regard to current stand conditions, regionally embedded growth and mortality relationships, and user-defined management options. Post processing of multiple stand simulations to describe the average stand condition for a group of similar stands is completed to create stratum-based yield tables. Yield tables were then produced for multiple strata under multiple management options for use in the timber model to allocate treatments on the landscape in order to obtain desired conditions. Documentation of the development of the timber yield tables is found in Summary of Yield Table Development for Forest Plan Revision (USDA Forest Service 2006).

Due to the advent of bark beetle outbreaks throughout the Shoshone, it was necessary to generate new yield tables to represent the current state and projected yields of lands affected by bark beetles. Lands determined to be affected by insects were represented by new simulation runs. Those lands determined to be not affected were represented by simulations done in 2006. Representation of bark beetle outbreaks was accomplished using FVS forest pest extensions. Those extensions were: Lodgepole Mountain Pine Beetle Model and Western Root Disease Model. Root disease impacts were not a component in any strata, but the Western Root Disease Model has bark beetle impact capabilities that were used to represent Douglas-fir beetle in the Douglas-fir forest cover type and spruce beetle in the Engelmann spruce/subalpine fir forest cover type. Dwarf mistletoe impacts were also included in the projections using the Dwarf Mistletoe Model where indicated by tree damage and severity codes in the inventory data.

All original inventory data used in the 2006 projections were used in the 2012 projections and no new data were introduced. Also unaltered were the strata classes to which the individual stands were assigned, as well as the calibration and regeneration parameters developed for the original FVS projections (USDA Forest Service 2012).

Spectrum Model

Spectrum, a forest planning model, was used to estimate the ASQ and long-term sustained-yield capacity for the Shoshone National Forest plan revision. Spectrum is a linear program-based model used to optimize the allocation of land and the scheduling of activities and outputs on a forest over a planning horizon (USDA Forest Service 2008b). Spectrum is available from the Forest Service's Inventory and Monitoring Institute in Fort Collins, Colorado. The latest version, Spectrum 3.0 was used in this analysis. A commercial linear program solver called C-Whiz (version 4.2) was used to solve the matrix generated by Spectrum. C-Whiz can be purchased from Ketron Management Science.

Spectrum utilizes data components that include land units, management actions, activities and outputs, costs and revenues, management objectives, and a planning time frame or horizon (USDA Forest Service 2008b).

Spectrum Land Units and Strata

Land units in Spectrum are defined by up to six layers of descriptive qualifiers or identifiers. For the Shoshone model, the planning area was stratified into land units based on six identifiers: timber objective, vegetation cover type (dominant species), habitat structural stage (stand density and size class), inventoried roadless area/roading classification, insect epidemic mortality, and ranger district.

Vegetation management prescriptions and yields are assigned based on a subset of the land units in Spectrum defined by cover type and habitat structural stage (see table 4). The yield tables developed for Plan revision were assigned based on this subset of land units.

To simplify model runs and since the model was only being used to model timber harvest, lands where timber harvest was not allowed were not included in the final Spectrum analysis. The spectrum analysis for altenative B was used for alternative G in the FEIS. All the land allocations in alternative G, including those for timber objectives and inventoried roadless, are the same as alternative B. As a result, the other changes in alternative G, don't result in a change to the timber harvest analysis.

Table 4. Spectrum strata

Spectrum Level Identifiers	Code and Definition	Notes
Timber objectives	TMPROD - Timber production TMHARV - Timber harvest allowed TMNOHV - Timber harvest not allowed	Identify suitable timber lands (timber production) and where other timber harvest was allowed or not allowed
Cover type	LP - Lodgepole SF - Spruce/Fir DF - Douglas fir LM - Limber pine AS - Aspen WB - Whitebark pine GRA - Grass and forbs NFL - Non-forested lands SHR - Shrublands WAT - Water OTH - Other tree species ALP - Alpine	Used to identify predominate cover type and to assign yield tables and prescriptions. Cover type was one of two attributes used to stratify yield tables.
Habitat structural stage	2T- Seedling/sapling 3A - Pole low density 3B - Pole medium density 3C - Pole high density 4A - Mature low density 4B - Mature medium density 4C - Mature high density 3T - Pole any density 4T - Mature any density 1M - Grass forb 2S - Shrubs TT - Any stage NA - Not applicable	Used to identify habitat structural stage and to assign yield tables and prescriptions. Habitat structural stage was one of two attributes used to stratify yield tables.

Table 4. Spectrum strata

Spectrum Level Identifiers	Code and Definition	Notes
Inventoried roadless area and roaded lands	IRARDD - Inventoried roadless area that is roaded IRAXXX - Inventoried roadless area without roads XXXRDD - Other forest areas that are roaded XXXXXX - Other forest areas without roads	Used to identify if lands were inventoried roadless areas and/or if lands were within one mile of a system road. Roading identifier was used to determine if new system road construction was needed to harvest timber.
Insect	INSECT - Impacted by insect epidemic XXX - Not impacted by insect epidemic	Used to identify conifer stands impacted by insect epidemic. Used to determine whether to assign yield tables simulated for insect epidemics.
Ranger district	CLRKFK – Clarks Fork Ranger District WAPITI - Wapiti Ranger District GRYBLL - Greybull Ranger District WNDRVR - Wind River Ranger District WSHKIE - Washakie Ranger District	Used to identify ranger district

Spectrum Miscellaneous Model Parameters

The Shoshone model uses a 200-year planning horizon, beginning in 2010. This time span consists of 20 periods or decades; each period is 10 years. A discount rate of 4 percent was used for economics.

Spectrum Timber Cost and Revenues Coefficients

Revenues

Revenues are based on sell data from 40 timber sales sold between 2004 and 2011. Only sales over 10 acres in size were used in the calculations for sawlogs. Sales smaller than 10 acres were not included in the calculations. These smaller sales tended to be unique, such as pile sales, and are not representative of what is being modeled in Spectrum. The 40 timber sales included represented over 97 percent of the timber sale volume and value sold between 2004 and 2011. A rate was calculated for green, dead, and mixed green/dead sawlogs. The rates for dead and mixed dead/green were within 20 percent of each other, so they were averaged together and one rate is being used for them. The green rate is approximately 50 percent higher, so it is being kept separate. Revenues developed are for all species. (See table 5.)

The fuelwood or products other than sawtimber (POL) value used is based on the free use rate of $7.50. An average of all fuelwood/POL sales from 2004 to 2011 yielded an average of $7.20. Based on the closeness of this number to the established rate of $7.50, we decided to use the established rate.

Table 5. Timber revenues

Product	Revenue (dollars per Ccf*)
Fuelwood/POL	7.50
Green sawtimber	31.90
Mixed Dead/green sawtimber	17.00

*Ccf = Hundred cubic feet

Timber sale-related costs

- Timber sale preparation, administration, and planning costs are based on costs experienced between 2006 and 2011.
- Stand exam costs are based on current contract costs. The cost is higher for surveys done within lynx habitat because additional data are gathered to analyze effects. The higher cost is used for the four northern ranger districts because the majority of the suitable timber lands on those districts fall within lynx analysis units (LAU). The lower cost is used on the Washakie Ranger District, which does not have any LAUs.
- Precommercial thinning costs are based on costs experienced on adjacent Forest Service units. Shoshone National Forest costs were not used because there have not been any recent contracts. In the last few years, funding has been allocated to fuels projects instead of precommercial thinning contracts.
- Planting costs are based on costs recently experienced on the Shoshone. There are three different rates: (1) a full rate for planting after wildfire; (2) an interplant rate that makes up the majority of our acres planted (this rate is lower because there is usually some amount of existing regeneration within planted stands); and (3) a rate for whitebark pine planting, which is more expensive overall both because it costs more to raise seedlings and to plant, given that planting sites tend to be more remote.
- Costs for road construction and reconstruction are based on costs experienced on the Shoshone. The difference between these costs is much less than is traditionally seen. This is related to the fact that much of our terrain and soils lead to higher costs, even for reconstruction.
- Costs for road maintenance and temporary roads are based on costs experienced on the 40 timber sales used in calculating the revenue numbers. (See table 6.)

Table 6. Activity costs

Activity	Cost
Sale preparation (dollars per Mcf*)	146.00
Sale administration (dollars per Mcf)	252.00
Sale planning (dollars per Mcf)	56.00
Stand exam (Clarks Fork, Wapiti, Greybull, Wind River Ranger Districts) (dollars per acre)	9.20
Stand exam (Washakie Ranger District) (dollars per acre)	8.20
Precommercial thinning (dollars per acre)	280.00
Planting – full planting (dollars per acre)	391.00
Planting – Interplanting (dollars per acre)	295.00
Planting – whitebark pine (dollars per acre)	$480.00
Road construction (dollars per mile)	23,000.00
Road reconstruction (dollars per mile)	21,150.00
Temporary roads (dollars per mile)	15,895.00
Extended skidding (dollars per Mcf)	204.10
Road maintenance (dollars per Mcf)	18.60

*Mcf = Thousand cubic feet

Output coefficients

The acre and volume coefficients for timber harvest are generated for the FVS yield tables used within the Spectrum model (see table 7). (See Timber Yield Table Development for discussion.)

Other coefficients

- Road reconstruction miles are based on the rates experienced in the 40 timber sales used in the revenue calculations. This coefficient applies to all timber sales on lands with existing roads and on the second entry on lands without existing roads.
- Two numbers were calculated for road construction miles. The number for lands with existing roads is based on rates experienced in the 40 timber sales used in the revenue calculations. There is always the potential for some new road construction, even in currently roaded areas. The number for lands without existing roads is based on the estimated miles needed to access a square mile of land considering skidding distances and the construction of some temporary roads.
- Temporary road miles are based on the rates experienced in the 40 timber sales used in the revenue calculations. This coefficient applies to all timber sales on lands with existing roads and on the second entry on lands without existing roads.
- The extended skidding cost is applied to lands where we cannot build a road system (inventoried roadless areas or IRA) or temporary roads. Those lands are managed with extended skidding distances up to one mile.
- Acres of planting are based on costs experienced on current timber sales.

Table 7. Output coefficients

Output	Coefficients
Road reconstruction	0.0043 mile per acre harvested
Road construction (lands with existing roads)	0.0003 mile per acre harvested
Road construction (lands without existing roads)	0.0031 mile per acre harvested
Temporary roads	0.0031 mile per acre harvested
Planting-full planting	0.75 acre planted per clearcut or fire salvage acres harvested
Planting-interplanting	0.20 acre planted per acre of final harvest other than clearcut
Planting-whitebark	0.75 acre planted per acre of restoration treatment (I don't think we will be modeling this in Spectrum, but still need to discuss)

Application of road coefficients

A description of how road coefficients were assigned to the strata in the different alternatives follows (see table 8). This description is not to be interpreted as forest plan direction, but rather as a way to model that direction within the spectrum model. Spectrum is only used to model the portion of timber harvest that will be sold as commercial timber. Under plan direction, trees can be cut for other purposes that do not require a road system to remove timber from the forest. Direction on where road construction is suitable is found in the forest plan.

For lands outside of IRAs, the assignment is straightforward and the same in all alternatives. In suitable timber lands, the only difference is based on roading and miles of new construction. For lands available for timber harvest, no new road construction is permitted.[4] However, temporary roads are allowed, and therefore, extended skidding costs are not needed. Road reconstruction costs are included regardless of whether the lands are roaded or not. When the area is not roaded, it is assumed that the reconstruction costs are being applied to roads outside of the area.

For lands within IRAs the assignment differs according to whether the alternative is consistent with the 2001 Roadless Conservation Rule. For alternatives A, E, and F the assignment is the same as for lands outside of IRA. For alternatives B, C, D, and G, there are no lands assigned as suitable timber lands within IRAs so there are no coefficients to apply. For timber harvest lands, no new system roads or temporary roads can be built, so those coefficients are not applied. Harvest on timber harvest lands can only occur if the harvest area is within one mile of an existing road and with the application of extended skidding. Road reconstruction costs are still applied under the assumption that the roads being reconstructed are outside of the area. Inventoried roadless area acres that are not within one mile of an existing road will not be harvested under the assumption that they are not accessible without the building of roads.

[4] There is one management area that is assigned to timber harvest lands that does allow new road construction. That is MA 4.2, travel corridors. Although new road construction is allowed, it would rarely be done for harvest because the corridor is a 0.5-mile buffer on existing roads, and all lands could be reached with skidding and temporary roads. So for the purpose of spectrum modeling these timber harvest lands can be lumped with other lands that don't allow new road construction.

Table 8. Application of road coefficients and costs by level identifiers

Road Status Attribute	Alternative	Land Suitability attribute	
		Timber production lands	Timber harvest, but not production
Lands that are not within inventoried roadless area and are within 1 mile of a system road.	All Alts	Road construction 0.0003 mile/acre harvested Road Reconstruction 0.0043 mile/ acre harvested Temporary roads 0.0031 mile/ acre harvested No extended skidding cost	No road construction Road Reconstruction 0.0043 mile/acre harvested Temporary roads 0.0031 mile/acre harvested No extended skidding cost
Lands that are not within inventoried roadless area and are not within 1 mile of a system road.	All Alts	Road construction 0.0031 mile/ acre harvested Road Reconstruction 0.0043 mile/ acre harvested Temporary roads 0.0031 mile/ acre harvested No extended skidding cost	No road construction Road Reconstruction 0.0043 mile/acre harvested Temporary roads 0.0031 mile/acre harvested No extended skidding cost
Lands that are within inventoried roadless area and are within 1 mile of a system road	Alts B, C, D, G	No acres of this type in these alts	No road construction Road Reconstruction 0.0043 mile/ acre harvested No temporary roads Use extended skidding cost
	Alts A, E, F	Same as lands not within inventoried roadless area	Same as lands not within inventoried roadless area
Lands that are within inventoried roadless area and are not within 1 mile of a system road	Alts B, C, D. G	No acres of this type in these alts	None of these acres will be harvested for timber in these alternatives
	Alts A, E, F	Same as lands not within inventoried roadless area	Same as lands not within inventoried roadless area

Timber Economic Suitability Analysis

Economic suitability is a financial analysis required during forest planning to determine the costs and benefits of a range of management intensities for timber production (36 CFR 219.14(b) 1982 regulations). It helps answer the question of whether lands suitable for timber harvest or production can produce timber cost effectively. The analysis is required for those lands that have not already been determined to be unsuitable for timber harvest. For each unique land class represented in the Spectrum model, the present net value (PNV) of each management prescription that might be applied to that land class is calculated. The PNV is the sum of discounted costs and revenues associated with the management prescription for the entire planning horizon. Costs and revenues in this analysis are expressed in 2010 dollars. Costs are explained in detail in the section *Spectrum Timber Costs, Revenues and Coefficients*. They include costs associated with planning and conducting a timber sale. Revenues are expected gross receipts to the government based on expected stumpage prices. Future costs and benefits are discounted to present values using a 4 percent interest rate.

Several factors about this analysis should be understood. First, no decisions about the management of the land are made at the conclusion of the analysis. Rather, the results are used for comparison between management regimes and are but one of many pieces of information used in the formulation of alternatives. Second, the analysis doesn't represent a single point in time. The management prescription is assumed to continue through time (regular harvest cycles for uneven-aged management and multiple rotations for even-aged management) and all costs and returns are considered over the entire 200-year planning horizon and discounted to the base year.

Results

The average PNVs for the Shoshone are negative to varying degrees, depending on the management prescription. For most management prescriptions, there was a wide range of PNV per acre values across the land types where the prescription may be applied. Most of the variation within a management prescription is explained by the age of the stand at the beginning of the planning horizon. Table 9 displays the average PNV values for each management prescription, and averages for young and mature stands within that management prescription.

Low or negative PNV occurs for various reasons. For most harvest treatments on the Shoshone, costs exceed revenues. Because of discounting, a prescription that has treatments in early decades will have a more negative PNV than the same prescription with treatments in later decades. This explains why for each management prescription, the younger stands have a less negative PNV than the older stands.

Table 9. Present net value by prescription by habitat structural stage (Mature = 4A, 4B, 4C, 4T; Young = all others)

Management Prescription	Age Class	Average PNV $/acre
Clearcut		**-163.15**
	Mature	-224.22
	Young	-31.72
Convert DF to Aspen		**-188.05**
	Mature	-214.48
	Young	-33.99
Convert SF to Aspen		**-116.11**
	Mature	-203.38
	Young	-14.80
Group Selection, opt. 1		**-150.57**
	Mature	-202.60
	Young	-18.04
Group Selection, opt. 2		**-20.89**
	Mature	-75.55
	Young	-6.58
Individual tree selection, opt. 1		**-110.36**
	Mature	-194.14
	Young	-12.54
Individual Tree Selection, opt. 2		**-92.91**
	Mature	-161.12
	Young	-5.83
Overstory Removal (opt.1)then Shelterwood		**-308.39**
	Mature	-308.39
Overstory Removal (opt.2) then Shelterwood		**-208.33**
	Mature	-208.33

Table 9. Present net value by prescription by habitat structural stage (Mature = 4A, 4B, 4C, 4T; Young = all others)

Management Prescription	Age Class	Average PNV $/acre
Overstory Removal (opt.3) then Shelterwood		**-140.74**
	Mature	-140.74
Seed Tree Cut w/ thin in exist and regen		**-78.31**
	Young	-78.31
Seed Tree Cut w/ thin in regen		**-143.00**
	Mature	-232.97
	Young	-53.24
Three Step shelterwood		**-68.32**
	Mature	-122.25
	Young	-9.14
Three Step Shelterwood pct		**-9.74**
	Young	-9.74
Two Step shelterwood		**-111.16**
	Mature	-144.10
	Young	-14.44

Fire and fuels analysis

Shoshone National Forest Wildland Fire Hazard Rating

Wildland fire hazard on the Forest was determined using FlamMap, a fire mapping and analysis PC-based program that describes potential fire behavior across a landscape under constant environmental conditions (weather and fuel moisture). Fire behavior was calculated for each 30x30 meter pixel of the forest using vegetation and topological characteristics combined with wind and live and dead fuel moistures. Fireline intensity or flame length was used as the indicator to determine a hazard rating across the forest landscape. Fireline intensity or flame length is related to the heat felt by a person standing next to the flames. See table 10.

Table 10. Hazard rating interpretation

Hazard Rating	Fireline Intensity (BTU/ft./s)	Flame Length (Feet)	Interpretation
Low	0 to 100	0 to 4	Fires can generally be attacked at the head or flanks by persons with handtools.
Moderate	100 to 500	4 to 8	Fires too intense for direct attack by persons with handtools; equipment such as dozers, engines or aircraft can be effective.
High	500+	8+	Torching, crowning, spotting may cause serious control problems, control at the head of the fire is ineffective.

Data used for the analysis were obtained from LANDFIRE, version LF 2010, May 2013. LANDFIRE data used for the analysis included:

- 40 Scott and Burgan Fire Behavior Fuel Models
- Forest Canopy Bulk Density
- Forest Canopy Base Height
- Forest Canopy Cover
- Forest Canopy Height
- Slope
- Aspect
- Elevation

Version LF 2010 reflected vegetation change and disturbance 1999 to 2010 for fire, vegetation management, and succession. Vegetation changes from fire, management, or succession after 2010 were not reflected in the data. Wildfires that have occurred since 2010 on the Shoshone include Norton Point (24,237 acres), Hole in the Wall (2,541 acres on the Shoshone), and Index Creek (214 acres). Management activities on the forest were not incorporated in the latest data version. Vegetation characteristics (fuel model change, increase in crown base height, decrease in canopy bulk density and decrease in canopy cover) were modified manually using Spatial Analyst in ArcMap for the wildfire areas to reflect a change in vegetation before running the FlamMap analysis.

FLAMAP Analysis

FlamMap calculates fire behavior characteristics based on fuels, topography, and weather (Finney 1998).

Inputs:

Potential fire behavior was modeled at the 90th percentile weather and fuel moisture conditions, equivalent to high to very high fire danger rating.

The 90th percentile conditions were calculated for the four National Fire Danger Rating System (NFDRS) Remote Automated Weather Stations (RAWS) used on the forest identified in the Cody Interagency Dispatch Zone Fire Danger Rating Operation Plan (CIDZFDOP), April 2013, version 1.0.

Crandall RAWS and Eagle RAWS were identified as the weather stations that best correlated weather conditions and fire business on the northern portion of the forest and Elkhorn RAWS and Anderson Ridge RAWS on the southern portion.

FireFamily Plus was used to determine percentile fuel moistures using Energy Release Component (ERC) and westerly winds (NW, W, and SW) for each station and then averaged for one live and dead fuel moisture value used in the FlamMap analysis. All four stations had similar fuel moisture values. See Table 11.

Table 11. 90th percentile fuel moistures

1-hr Fuel Moisture	10-hr Fuel Moisture	100-hr Fuel Moisture	Herbaceous Fuel Moisture	Woody Fuel Moisture
3%	4%	6%	50%	70%

Live fuel moistures were estimated rather than calculated using FireFamily Plus. The calculated values are generally inaccurate and commonly estimated based on time of year and average curing rates.

Weather is entered as a single event without any temporal variation and is represented by wind. West wind direction was used as it reflects between 65 to 81 percent of the wind direction at the four RAWS. A 20-foot wind speed of 20 mph was estimated to represent 90th percentile conditions. Wind Ninja wind vectors within the FlamMap model were used to reflect wind direction and speed based on topological influences.

Outputs:

The FlamMap output used for the analysis was flame length. The raster data from the output was downloaded into ArcMap for display purposes and acres were calculated from the data.

A significant part of the portion contains non-burnable fuels as reflected in the flame length outputs of zero feet. Not all of the areas with zero feet flame length were considered non-burnable as flame lengths less than 0.5 feet are rounded down to zero. Areas with low flame lengths include some of the more recent wildfires where fuels have not regrown or accumulated enough to reflect a flame length. The 40 Scott and Burgan Fire Behavior Fuel Models layer was used to determine the areas that were non-burnable as shown in table 12. The acres of non-burnable were subtracted from the total acres that FlamMap estimated to have a zero flame length.

The acres calculated from the data were 154 acres less than the 2,438,150 acres currently assigned to the Shoshone. To match the acres, each rating area was manually assigned an additional 51.3 acres to balance the forest acres.

Table 12. Unburnable areas

Description	Acres
91-NB1 Urban Development	1,682
92-NB2 Snow/Ice	14,742
93-NB3 Agriculture	44
98-NB8 Open Water	13,618
99-NB9 Bare Ground	539,935
Total	570,021

Table 13. Forest hazard rating

Hazard Rating	Description	Acres
None	Unburnable Fuels	570,021
Low	Flame Length 0-4 ft.	696,189
Moderate	Flame Length 4-8 ft.	345,500
High	Flame Length 8+ ft.	826,440
Total		2,438,150

Wildfire costs calculations

Seven large fires that ranged in size from 214 to 68,148 acres during the period of 2008 to 2012 were used to the derive costs estimates for the alternatives. These fires were managed for protection and/or resource benefits objectives and management responses ranged from monitoring, partial suppression, point protection and full suppression. The season of 2008 was selected as the starting year since it is the

same year that the 1986 Forest Plan was amended to allow the management of wildfires outside of wilderness as well as providing managers with the full range of response options for managing wildfire. The revised Forest Plan would continue with the same management direction as what is currently in the amended plan. Based on the similarity in management direction, it was determined that the costs associated with managing large fires on the Forest would be representative of future cost for the next 10 to 15 years. All wildfire costs were adjusted to 2013 dollars. (See table 14, table 15, and table 16.)

Table 14. Shoshone National Forest wildfire suppression costs (2008 to 2012)

Fire Name	Zone	Year	Acres Burned	Cost	Rehab Cost	WFM Cost/acre	Rehab Cost/acre
Gunbarrel	NZ	2008	68,148	$11,200,000	$368,500	$164	$5
Castle	NZ	2009	326	$100,000	$0	$307	$0
North Fork	SZ	2010	333	$900,000	$0	$2,703	$0
Norton Point	SZ	2011	24,237	$1,900,000	$79,500	$78	$3
Hole in the Wall	NZ	2011	6,343	$4,250,000	$0	$670	$0
Warm Springs	SZ	2011	807	$370,000	$0	$458	$0
Index	NZ	2012	214	$825,000	$0	$3,855	$0
Total			**100,408**	**$19,545,000**	**$448,000**	**$195**	**$4**

Data from FIRESTAT (fire report) for fire cost and acres burned

Table 15. 2008-2012 wildfire cost adjusted to 2013 dollars

Fire Name	Zone	Year	Acres Burned	2013 Wildfire Cost	2013 Rehab Cost	2013 WFM Cost/ac	2013 Rehab Cost/ac
Gunbarrel	NZ	2008	68,148	$12,096,200	$397,500	$177	$6
Castle	NZ	2009	326	$108,387	$0	$332	$0
North Fork	SZ	2010	333	$959,744	$0	$2,882	$0
Norton Point	SZ	2011	24,237	$1,964,128	$82,183	$81	$3
Hole in the Wall	NZ	2011	6,343	$4,393,443	$0	$693	$0
Warm Springs	SZ	2011	807	$382,488	$0	$474	$0
Index	NZ	2012	214	$835,554	$0	$3,904	$0
Total			**100,408**	**$20,739,944**	**$479,683**	**$207**	**$5**

CPI inflation calculator used - *http://data.bls.gov/cgi-bin/cpicalc.pl*

Table 16. Wildfire cost by alternative (2013 dollars)

Alternative	Acres Burned	Wildfire Cost	Rehab	Total Cost
A	185,200	$38,254,299	$884,763	$39,139,062
B	182,900	$37,779,218	$873,775	$38,652,994
C	184,100	$38,027,086	$879,508	$38,906,594
D	184,000	$38,006,431	$879,030	$38,885,461
E	175,000	$36,147,421	$836,034	$36,983,455
F	161,400	$33,338,250	$771,062	$34,109,312
G	182,900	$37,779,218	$873,775	$38,652,994

References

Finney, M.A. 1998. FARSITE: Fire Area Simulator – Model development and Evaluation. Res. Pap. RMRS-RP-4. Ogden UT: USDA Forest Service Rocky Mountain Research Station. 47 p. [0360]

LANDFIRE 1.2.0 Existing Vegetation Type layer.U.S. Department of the Interior, Geological Survey. [Online]. Available:http://landfire.cr.usgs.gov/viewer/ [2013, May 3].

Wildlife Grizzly Bear Denning Analysis

The following section summarizes how the information from Podruzny et al. 2002 and grizzly bear amendment (2006) was used to address snow machine use on grizzly bear denning habitat. In the rest of this discussion those references will be referred to as the denning analysis. The assumptions used in the denning analysis to identify what areas were closed to snowmobiling are different than what we use in this EIS. For the Shoshone, the areas identified as closed in the denning analysis include areas with closure orders, generally inaccessible terrain that was seldom used, and winter range areas that would have a closure order applied if there was ever more than incidental use. In this EIS, we identify areas as being open to use if plan direction allows it, even if there is little chance of anything besides incidental use occurring. As a result, in this EIS analysis alternative A shows more area open to winter motorized use than what is actually occurring or than what is shown in the denning analysis. The action alternatives displayed in this EIS definitively identify areas that will be open or closed to snowmobile use, so they are comparable to the analysis assumptions used in the denning analysis. Of the action alternatives, alternative B is designed to be most like alternative A, and as such, would be most comparable to the no-action alternative used in the denning analysis. The percentage of the forest closed to snowmobile use in alternative B is 80 percent and is very close to the 78 percent of closed denning habitat shown in the denning analysis. For the purposes of this EIS analysis, we will use the percentage of closed area we have calculated for the action alternatives. Though the absolute amounts may not be correct, we feel they are close and that they provide good metrics for comparing the alternatives. To account for the approximation represented by this approach, the percentages were rounded to the nearest 10 percent.

Scenery Management

Introduction

The Forest Service, in cooperation with other agencies, academic institutions, organizations, and private practitioners, developed the Scenery Management System (SMS) in 1994 to provide managers with a

systematic approach for determining the relative value and importance of scenery in a national forest. The SMS evolved from and replaced the Visual Management System (VMS), which was used in the existing forest plan. The SMS takes the VMS process one step further by rating the importance of the landscape and by developing scenic classes that measure the value of a landscape being viewed. It allows managers to compare the scenic value of a landscape with the value of other resources during the planning process.

National Direction

Forest Service Manual (FSM) 2380.3 requires the agency to "inventory, evaluate, manage, and, where necessary, restore scenery as a fully integrated part of the ecosystems of National Forest System lands through the land and resource management and planning process." FSM 2380.31 specifies the use of the basic concepts, elements, principles, and variables defined in *Landscape Aesthetics, A Handbook for Scenery Management* (USDA Forest Service 1995). The handbook outlines the vocabulary and systematic approach that is SMS and was used in this plan revision process to identify scenic classes across the Shoshone National Forest.

Scenery Analysis

Scenery management analysis involved identifying scenic components as they relate to people viewing them, mapping these components using GIS and existing data, and assigning a value for aesthetics. This value, or scenic class, provided information for the revision process.

Data in the Forest GIS database were used for the analysis. Scenic attractiveness, distance zones, and concern levels were combined to establish scenic classes. Scenic classes were then combined with scenic integrity to develop landscape character goals and scenic integrity objectives. The following describes the analysis process applied.

Scenic Attractiveness

Scenic attractiveness classes are developed to determine the relative scenic value of lands within a landscape. The first step in defining scenic attractiveness was the development of landscape character Descriptions for land units across the Shoshone. Landscape character descriptions provided the frame of reference for defining the scenic attractiveness classes. The land units used are subsections, a level of the national ecological hierarchy for the Shoshone. Subsections are land units with common vegetation, landform, soils, and geology. A description of these physical and biological features was combined with the scenic attributes of the landscape to create scenic attractiveness classes.

Three scenic attractiveness classes were used in the analysis as prescribed by the SMS. They are:

- **Class A** - Distinctive
- **Class B** - Common or typical
- **Class C** - Indistinctive

Landscape elements of vegetation, cultural features, water features, relief, and vegetation characteristics are all considerations in developing the scenic attractiveness map. Using GIS, subsections (Land Type Associations Layer) across the Forest were categorized into the three scenic attractiveness classes as follows.

Scenic Attractiveness Class A

1. High dissection, high percentage of rock, steep slope
    a. Land type described as highly dissected
    b. Land type with elevations ranging above 8,000 feet and slopes ranging above 70 percent

c. Land type description of greater than 75 percent rock outcrops.

2. High elevation
    a. Land type with elevations above 10,000 feet
    b. Land type with predominately alpine vegetation

3. High occurrence of lakes and stream bottoms.
    a. Land types that have a high number of lakes as determined by visual inspection,
    b. Land types associated with stream bottoms.

In addition, selected lakes greater than 25 acres in size and 40 selected streams (see table 17) were buffered by 0.25 mile and identified as scenic attractiveness class A.

Table 17. Streams assigned to scenic attractiveness class A

Beartooth Creek	Greybull River	Roaring Fork Creek
Cabin Creek	Grinnell Creek	Shoshone River
Clarks Fork Yellowstone River	Index Creek	South Fork Shoshone River
Clearwater Creek	Ishawooa Creek	South Fork Warm Spring Creek
Crandall Creek	Lake Creek	South Fork Wood River
Crazy Creek	Little Popo Agie River	Sunlight Creek
Dead Indian Creek	Middle Fork Wood River	Sweetwater Creek
Deer Creek	Middle Popo Agie River	Venus Creek
Dinwoody Creek	North Fork Crandall Creek	Warm Spring Creek
Dunoir Creek	North Fork Shoshone River	West Dunoir Creek
Eagle Creek	North Popo Agie River	Wind River
East Dunoir Creek	Pass Creek	Wood River
Fishhawk Creek	Pilot Creek	
Gannett Creek	Rampart Creek	

Scenic Attractiveness Class B

All lands not classified as A or C were classified as scenic attractiveness B.

Scenic Attractiveness Class C

All land types that had a primary vegetation component of grass or sage brush were classified as scenic attractiveness C, if they were not already in the A category.

Landscape Visibility

Concern levels and distance zones help define landscape visibility.

Concern Levels

Concern levels are a measure of the degree of importance the public places on landscapes viewed from travelways and use areas. Normally, areas are assigned a concern level value from 1 to 3 to reflect the relative high-to-low importance of a scene. Concern level is a function of both the number of visitors as well as their intent, so, for example, an interstate highway and a wilderness trail can both be mapped as

concern level 1. Concern level 3 was initially considered in the process, but the majority of the Shoshone falls within concern levels 1 and 2, so concern level 3 was dropped from the analysis. Areas on the Forest were assigned the following concern levels using the Forest GIS database.

- **Level 1** was assigned to primary travelways, areas of concentration such as recreation facilities, special designations such as scenic byways or national recreation/historic trails and cultural sites. Users have a high level of concern for scenery in these areas.
- **Level 2** was assigned to areas of local importance such as state highways, county roads, secondary trails, scenic overlooks, summer home tracts, etc. The remainder of the Shoshone was assigned this concern level.

Distance Zones

Distance zones are measured from the viewpoint of the concern level areas (1 or 2) to determine the relative sensitivity of scenes, based on their distance from an observer. Distance zones are an important part of scenery analysis, because as the distance increases, the level of visible detail decreases. And, as distance increases, so does the opportunity to mitigate the impacts to scenery. Distance zones are divided into three categories:

- **Foreground** - 0 to 0.5 mile from the viewer
- **Middleground** - up to 4 miles from the foreground, or 0.5 to 4 miles
- **Background** - greater than 4 miles from the viewer to the horizon

Using GIS software, points were placed every 0.5 mile on system roads and every mile on system trails. Roads and trails had previously been classified as concern levels 1 or 2. The result was a point data set of "seen areas." A viewshed model was then applied to the seen data to determine what is visible. On forests like the Shoshone with a lot of topographic relief, visibility is also affected by steep terrain, ridges, road cuts, etc. A 30-meter Digital Elevation Model was used to determine potentially visible areas. The result was an estimate of what can be seen from points across the Forest and the relative importance of the view.

Scenic Classes

The results of the scenic attractiveness and landscape visibility analyses are combined to produce scenic classes (not to be confused with scenic attractiveness class). Scenic classes are numerical ratings from 1 to 7 that rank the relative scenic value of landscape areas, with 1 being the most important or valuable. The ratings are determined using a matrix of the scenic attractiveness and landscape visibility indicators. Table 18 shows the scenic class matrix.

Table 18. Scenic class values derived from scenic attractiveness and landscape visibility analyses

	Distance Zone/Concern Level[5]						
Scenic Attractiveness		FG1	MG1	BG1	FG2	MG2	BG2
	A	1	1	1	2	2	2
	B	1	2	2	2	3	4
	C	1	2	3	2	4	5

Scenic Integrity Objectives

Scenic integrity objectives (SIO) are the product of the scenery analysis process and are derived by considering the scenic classes, existing scenic integrity levels, and the integration of other resource objectives. Scenic integrity refers to the degree of direct human-caused deviation in the landscape from activities such as road construction, timber harvesting, mining, etc. Before SIOs were developed, existing scenic integrity was determined and mapped. This is basically an inventory of the current status of the landscape and the scenery analysis just described in the previous sections. It tells resource specialists and decision makers how much visible disruption there is for a given landscape.

There are six levels of scenic integrity ranging from very high to unacceptably low. Very high represents areas that are unaltered or have only minor alterations. Landscapes classified as unacceptably low are characterized by evident deviations from the natural landscape.

For the forest plan revision effort, lands were classified into four of the six possible scenic integrity objective levels; very high, high, moderate and low. For alternative A, the existing visual quality objectives developed under the VMS system were converted as shown in table 19.

Table 19. Scenic integrity objective crosswalk from visual quality objectives

Scenic Integrity Objective (SMS)	Visual Quality Objective (VMS)
Very High - unaltered	Preservation
High – appears altered	Retention
Moderate – slightly altered	Partial Retention
Low – moderately altered	Modification

The scenic integrity objectives guide the type of management activity as well as the amount, degree, intensity, and distribution of those activities needed to achieve goals. They may be expressed as forest plan goals and objectives, and in other cases as standards and guidelines.

Management area direction was combined with scenic classes to map the scenic integrity objectives on the Forest. Table 20 shows the outcome.

[5] Distance Zone codes are FG = Foreground, MG = Middleground, BG = Background. The number after the Distance Zone code is the Concern Level.

Table 20. Scenic integrity objectives by management area and scenic class

Management Area	Scenic Class	Scenic Integrity Objective
1.1	1,2,3,4,5	Very High
1.1A	1,2,4	Very High
1.2	1,2,3,4	Very High
1.2A	1,2	Very High
1.2B	1,2,3	Very High
1.3	1,2	High
1.3	3,4	Moderate
1.5A	1,2	Very High
1.6A	1,2	Very High
1.6B	1,2,3	Very High
2.2A	1,2	Very High
2.3	1,2	Very High
3.1A	1,2	High
3.1B	1,2	High
3.1B	3	Moderate
3.1C	1,2	High
3.3A	1,2	High
3.3A	3,4	Moderate
3.3B	1,2	High
3.3B	3,4	Moderate
3.3C	1,2	High
3.3C	3,4	Moderate
3.5	1,2,3,4	Moderate
3.5A	1,2,3,4	Moderate
3.5B	1,2,3,4	Moderate
3.5C	1,2,3,4	Moderate
3.5D	1,2,3,4	Moderate
4.2	1,2,3	High
4.2	4	Moderate
4.3	1,2,3,4	Moderate
4.5A	1	Moderate
5.1	3,4	Low
5.1	1,2	Moderate
5.2	1,2	Moderate
5.2	3,4	Low
5.4	1,2	Moderate
5.4	3,4	Low
8.2	1,2	High

Recreation Opportunity Settings

Since the early 1980s, the recreation opportunity spectrum (ROS) has been used as a framework for identifying, classifying, planning, and managing a range of recreation settings. Six distinct settings: urban, rural, roaded natural, semi-primitive motorized, semi-primitive non-motorized, and primitive are defined using specific physical, managerial, and social criteria. For detailed information on ROS categories and criteria, refer to the ROS User Guide, 1982 USDA Handbook.

Existing ROS was remapped for the Shoshone using the latest GIS data and direction in the ROS User Guide. It is understood that ROS mapping is not an exact science and some flexibility is necessary at the ground level to deal with specific conditions and anomalies that are not exact matches with specific ROS class criteria and definitions.

Mapping Process – existing ROS setting

The following section outlines the steps to map existing ROS classes. The first steps describe the process and data layers necessary in producing initial ROS maps using GIS. Remaining steps are the adjustment of initial GIS maps using local expertise about the landscapes and use patterns.

Mapping criteria derived from the ROS User Guide were used in defining the physical, social and managerial setting of each landscape:

Identify division between motorized and non-motorized ROS settings. Motorized ROS settings are areas within 0.5 mile of motorized travel routes. Motorized travel routes include roads and motorized trails where motorized use is allowed.

A further refinement of motorized areas requires a roads designation of “better than primitive” or “primitive.” For this analysis, better than primitive roads are defined as roads designed for use by highway vehicles. We defined this as maintenance level 3, 4, and 5 roads. All other roads and motorized trails were defined as primitive.

All motorized routes were buffered by 0.5 and 3 miles. Areas that fell within 0.5 mile of a motorized route were classified as “motorized.” All areas outside were classified as “non-motorized.”

Classify non-motorized lands as either primitive or semi-primitive non-motorized. Areas 3 miles or greater away from motorized routes were initially classified as primitive. Areas less than 3 miles and more than 0.5 mile from all roads and motorized trails were initially classified as semi-primitive non-motorized.

Classify initial semi-primitive motorized and roaded natural ROS settings. Using the resulting work, further delineate motorized ROS settings as either semi-primitive motorized or roaded natural. Polygons within the 0.5-mile buffers of routes designated as primitive were classified as semi-primitive motorized (SPM). Areas within 0.5-mile buffers of “Better than Primitive” roads were classified as roaded natural (RN).

Apply size criteria to primitive and semi-primitive polygons. This step identifies areas meeting the various size criteria as well as identifying areas that don’t meet the size criteria. The areas not meeting the size criteria were analyzed to ensure other criteria are fully considered before eliminating the area due strictly to remoteness and size. Areas greater than or equal to 5,000 acres meet all criteria for primitive (P). Those that don’t meet the 5,000 acres were evaluated further as described below.

Areas identified as semi-primitive non-motorized (SPNM) with a size greater than or equal to 2,500 acres were selected. These areas meet all criteria for SPNM. Areas not meeting the size criteria were further evaluated as described below.

Areas identified as "SPM" polygons greater than or equal to 2,500 acres were selected. These areas meet all criteria for SPNM. Remaining "SPM" polygons smaller than the 2,500 acres were further evaluated as described below.

Conduct adjacency assessment to refine P, SPNM, and SPM settings that do not meet size criteria. For those areas initially mapped as primitive, but that were smaller than 5,000 acres, adjacent ROS settings were examined. It is possible for them to be contiguous to semi-primitive non-motorized areas, yet still provide a primitive experience. In our process, this situation did not exist and these areas were classified as one of the semi-primitive settings.

For SPNM areas that did not meet the 2,500-acre size criteria, adjacent ROS designations were considered. When adjacent lands were primitive, the area could still provide an SPNM experience, and it was mapped as such. In addition, if the area was isolated due to topography or other permanent landscape features, the area, even though not 2,500 acres, could still provide SPNM. These determinations were made by interdisciplinary team members.

There may also be instances where a small SPNM setting is engulfed by an SPM setting. In this case, the SPNM setting would become part of the SPM polygon. Although motorized use is not allowed in this portion of the setting, it contributes to the semi-primitive character.

Small SPM settings that were not adjacent to other semi-primitive areas were coded as roaded natural.

Distinguish between roaded natural and rural. No size criteria apply to roaded natural or rural ROS classes. Remaining buffered areas within 0.5 mile of "better than primitive roads" were classified as "RN." The only area classified as rural was the ski area along the North Fork of the Shoshone. The classification was assigned based upon the highly developed nature of the site and is consistent with the classification made in the existing forest plan.

Wilderness Settings

Wilderness settings are related to recreation opportunity spectrum (ROS) settings insofar as ROS is a starting point. The existing forest plan identified wilderness settings as different management areas (management areas 8A, 8B, and 8C). A forest team of recreation specialists from the Shoshone National Forest Supervisor's Office and the ranger districts modified the current forest plan settings for plan revision, based on current management direction and conditions on the ground. That process generally followed the following criteria. In the new revised plan, wilderness settings are not split into separate management areas. They are treated like ROS and are an inventory that is used in making management decisions.

Semi-primitive – areas adjacent to heavily used trails where there are higher encounters with other people.

Primitive – areas not classified as semi-primitive or pristine

Pristine – areas that are more than 1 mile away from system trails.

For alternative analysis, wilderness settings were applied to the recommended wilderness areas using the following criteria shown in table 21.

Table 21. Wilderness setting criteria for recommended wilderness areas in alternatives C and D

Existing ROS setting	Distance from system trail	Assigned wilderness setting
Roaded natural	Any distance	Semi-primitive
Semi-primitive motorized	Any distance	Semi-primitive
Semi-primitive non-motorized	0 to ¼ mile	Semi-primitive
	Greater than ¼ mile	Primitive
Primitive	0 to ¼ mile	Semi-primitive
	¼ to 1 mile	Primitive
	Greater than 1 mile	Pristine

ROS management area objectives

The mapping discussed above describes the existing ROS setting based on conditions on the ground. The interdisciplinary team identified ROS objectives for each management area, based on the desired conditions for the management area and the existing ROS setting. Table 22 shows how those assignments were made.

Table 22. ROS objectives assignments for management areas

Management Area	Existing ROS classification	ROS objective
1.1, 1.1A, 1.2, 1.2A, 1.2B	Any	Primitive
1.3	Any	Semi-primitive non-motorized
1.5A	Roaded natural or semi-primitive motorized	Semi-primitive motorized
	Semi-primitive non-motorized	Semi-primitive non-motorized
1.6A, 1.6B, 2.2A, 2.3	Any	Semi-primitive non-motorized
3.1A, 4.5A	Any	Roaded natural
3.1B	Roaded natural or Semi-primitive motorized	Semi-primitive motorized
	Semi-primitive non-motorized	Semi-primitive non-motorized
3.1C	Semi-primitive motorized or Semi-primitive non-motorized	Semi-primitive non-motorized
3.3A, 3.3C, 3.5, 3.5A, 3.5B, 3.5C, 3.5D[6]	Any	Semi-primitive motorized
3.3B	Any	Semi-primitive non-motorized
4.2, 4.3	Any	Roaded natural
5.1 or 5.2 or 5.4	Roaded natural	Roaded natural
	Semi-primitive motorized or Semi-primitive non-motorized or primitive	Semi-primitive motorized
8.2	Any	Rural

[6] 3.5B and 3.5D are both assigned to semi-primitive motorized, because of the overall objective to conduct vegetation management where some motorized activity could be expected. Objective does not change the overriding direction for what type of recreation experience is to be provided for.

Social and Economic Analysis

Social and economic impacts and economic efficiency were analyzed for each alternative. Social and economic impacts were measured in terms of changes to jobs and income. Economic efficiency was measured based on changes in present net value.

Economic Impacts

Introduction

Economic effects to local counties were estimated with input-output analysis using the IMPLAN (IMpact analysis for PLANning) modeling system (MIG 2010) and FEAST (Forest Economic Analysis Spreadsheet Tool). The IMPLAN modeling system allows the user to build regional economic models of one or more counties for a particular year. The model for this analysis used the 2009 IMPLAN data. FEAST is a spreadsheet modeling tool that serves as an interface between user inputs and imported data from an existing IMPLAN model.

Input-output analysis is a means of examining relationships within an economy, both between businesses and between businesses and final consumers. It captures all monetary market transactions for consumption in a given time period. Economic impact analysis is defined as “the net change in economic activity associated with an industry, event, or policy in an existing regional economy” (Watson et al. 2007). By using Forest Service expenditure data, resource output data, and other economic information, IMPLAN can describe, among other things, the jobs and income that are supported by NFS management activities. The direct employment and labor income benefit employees and their families and therefore directly affect the local economy. Additional indirect and induced, multiplier effects (ripple effects) are generated by the direct activities. Together the direct and multiplier effects comprise the total economic impact to the local economy. The data used to estimate the direct effects from timber harvest is information provided by University of Montana’s Bureau of Business and Economic Research. The data used for estimate the direct effects from livestock grazing includes price information from the U.S. Department of Agriculture’s Economic Research Service and expenditure information from University of Idaho livestock budgets. The data used to estimate the direct effects from recreation is information from the Forest Service’s latest National Visitor Use Monitoring (NVUM) report for the Shoshone National Forest and Shoshone National Forest recreation permits records. The economic effects tied to other Forest Service programs and the multiplier effects were estimated using IMPLAN. Resource specific data (recreation visits, animal unit months of grazing, timber volume harvested, etc.) were collected. For current management levels, a 3-year average using 2008 to 2010 data were calculated for resources to eliminate the year to year variability inherent in the data.

Procedures

To estimate the economic impacts to the Shoshone National Forest area economy, one IMPLAN model covering three counties was developed. The counties included Fremont, Hot Springs, and Park counties in Wyoming. This area defines the functional social and economic planning area. Labor flows between towns and counties are generally contained within these three counties. Flows of labor, goods, and services between this area and other counties are not captured in the model, but considered as exports or imports.

Impact analysis describes what happens when a change in final sales (e.g., to non-residents—or exports—and governments) occurs for goods and services in the model region. Changes in final sales are the result of multiplying production data (e.g., cubic feet of timber or recreation visits by non-locals) times sales. Economic impacts were estimated using the best available production and sales data.

Impacts to local economies are measured in two ways: employment and labor income. Employment is expressed in jobs. A job can be seasonal or year-round, full-time or part-time. Jobs represent the annual average of 12 monthly estimates. There is no seasonality in this measure. The income measure used was labor income expressed in 2009 dollars. Labor income includes both employee compensation (pay plus benefits) and proprietor income (e.g., self-employed).

The planning area model was used to determine total consequences of dollar, employment, and income changes in selected sectors. Because input-output models are linear, multipliers or response coefficients need only be calculated once per model and then applied to the direct change in final demand. Methods for developing response coefficients and levels of dollar activity are explained below.

Data and Assumptions

Timber Production

Current levels were developed from historic harvest levels on the forest. Products were broken out by sawtimber, products other than logs, and salvage. For the alternatives, timber production levels were derived using the Spectrum model. It was assumed that the predicted timber sold in the model would be harvested in the same timeframe. Because the vast majority of timber volume was sawtimber and because there are no longer any large-scale sawmills in the study area, the analysis only considered the economic impact of logging for the timber harvest with lumber processing assumed to occur outside the study area.

The data used to estimate the direct effects from timber harvest were developed by University of Montana's Bureau of Business and Economic Research for the Central and Southern Rocky Mountain Region, which includes Wyoming. The indirect and induced effects were generated by the IMPLAN model.

General and Commercial Recreation

General recreation visitor days were calculated using the most recent National Visitor Use Monitoring (NVUM) data for the Shoshone National Forest. The current level was based on the most recent data collection, which occurred in fiscal year 2009. Recreation figures were held constant for all alternatives.

In addition to the general recreation use of the Shoshone National Forest, a number of commercial recreation businesses also operate on the Forest. Much of this recreation activity is probably not captured in the NVUM data. Shoshone National Forest data on the recreation permit fees associated with this commercial recreation activity were used to estimate the direct impacts of the commercial recreation use on the forest. The estimates of secondary impacts for both general and commercial recreation were generated by the IMPLAN model.

Grazing

Due to variability in livestock prices, a 10-year average price (2000 to 2009) is used in the analysis. In order to make the analysis more reflective of the livestock industry in the study area the “analysis-by-parts” procedure, based on a 2010 University of Idaho livestock budget for a 500 head cow-calf ranch, was used to input the expenditure data into the IMPLAN model for the study area. Three firm-level perspectives were considered in the economic assessment including: (1) evaluating Forest Service animal unit months (AUMs) only, (2) evaluating Forest Service AUMs in terms of their impact on ranch productivity, and (3) evaluating Forest Service AUMs in terms of their impact on ranch viability. These perspectives were based on a previously developed multi-period linear program model for Federal lands-dependent ranches in Wyoming. For the economic analysis, impacts were considered under the third level, or evaluating Forest Service AUMs in terms of their impact on ranch viability.

The direct, indirect, and induced effects from changes in grazing levels were generated by the IMPLAN model. The levels of livestock grazing were varied by alternative, based on estimates from the Shoshone.

Minerals

Because the Shoshone has had little or no mineral activity for the last 25 years, projections are for a low probability of any development during the planning period, and projections that any development that did occur would be the same in all alternatives, no economic analysis of minerals was conducted.

Federal Expenditures and Employment

Total employment and salaries paid by the Forest Service were based on a 3-year average for 2008 to 2010. Total Forest expenditures were also based on a three-year average (2008 to 2010). The direct, indirect, and induced effects from changes in forest expenditures and employment were generated by the IMPLAN model. The levels of forest expenditure varied by alternative based on estimates from the Shoshone National Forest.

Output Levels

Table 23 displays the output levels that were used to perform the economic impact analysis.

Table 23. Resource outputs by alternative used for economic impact analysis

Activity	Units	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G
Saw Timber	Mcf/decade	14,634	14,211	12,543	13,574	18,782	25,848	14,211
POL	Mcf/decade	804	764	715	735	1,030	1,400	764
Salvage	Mcf/decade	1,564	1,578	1,631	1,576	2,328	3,264	1,578
Livestock Grazing	AUMs/year	55,881	55,881	31,401	55,881	58,329	61,497	55,881
Non-local Day Trips	Trips/year	96,909	96,909	96,909	96,909	96,909	96,909	96,909
Non-local Overnight on Forest	Trips/year	32,303	32,303	32,303	32,303	32,303	32,303	32,303
Non-local Overnight off Forest	Trips/year	96,909	96,909	96,909	96,909	96,909	96,909	96,909
Local Day Trips	Trips/year	284,266	284,266	284,266	284,266	284,266	284,266	284,266
Local Overnight on Forest	Trips/year	25,842	25,842	25,842	25,842	25,842	25,842	25,842
Local Overnight off Forest	Trips/year	19,382	19,382	19,382	19,382	19,382	19,382	19,382
Non Primary Trips	Trips/year	90,448	90,448	90,448	90,448	90,448	90,448	90,448

Economic Efficiency

Economic efficiency is defined as how well the dollars invested in each alternative produce benefits to society. Present net value was used as an indicator of economic efficiency.

To calculate present net value, a spreadsheet was used which tracks revenues, costs, and benefits for a 50-year period. Built into the spreadsheet were predicted increases and decreases to output levels over time. A 4 percent discount rate was used.

Table 24 displays the economic values that were used for each resource. All values were input as 2012 dollars. The values were derived from different sources. Timber revenues were those reported by the Spectrum model. Range values were based on the rate for private grazing fees for 2008 in the State of

Wyoming. Recreation, fish, and wildlife values were based on an analysis of the National Visitor Use Monitoring data (Bowker et al. 2009) and a draft report on Resource Planning Act (RPA) non-market values (Retzlaff 2010). Costs were a 3-year average of actual expenditures by program area for fiscal years 2008 to 2010.

Table 24. Values used for present net value analysis

Activity	2012 Dollar Value	Source
Sawtimber (M$)	$31.90	From spectrum model by alternative
Mixed dead/green sawtimber	$17.00	From spectrum model by alternative
Fuelwood/POL	$ 7.50	From spectrum model by alternative
Livestock grazing (AUMs)	$19.12	
Recreation ($/Visit)		
Camping	$31.53	Retzlaff 2010 RPA updates
Motorized Recreation	$51.46	Retzlaff 2010 RPA updates
General Recreation	$24.22	Retzlaff 2010 RPA updates
Hiking	$97.62	Retzlaff 2010 RPA updates
Nature-based Recreation	$40.35	Retzlaff 2010 RPA updates
OHV Use	$66.12	Retzlaff 2010 RPA updates
Primitive Camping	$32.51	Retzlaff 2010 RPA updates
Picnicking	$50.98	Retzlaff 2010 RPA updates
Skiing, Alpine	$199.80	Retzlaff 2010 RPA updates
Snowmobiling	$182.56	Retzlaff 2010 RPA updates
Fish & Wildlife ($ / Visit)		
Hunting	$47.19	Retzlaff 2010 RPA updates
Fishing	$70.17	Retzlaff 2010 RPA updates
Viewing wildlife and nature	$40.08	Retzlaff 2010 RPA updates

References

Bowker, M., C.M. Starbuck, D.B.K. English, J.C. Bergstrom, R.S. Rosenberger, and D.W. McCollum. 2009. Estimating the net economic value of national forest recreation: An application of the national visitor use monitoring database. Athens, GA: The University of Georgia, Department of Agricultural and Applied Economics. 222 pp.

Minnesota IMPLAN Group (MIG). 2010. 2009 IMPLAN model for Fremont, Hot Springs, and Park County, Wyoming.

Retzlaff, Michael. 2010. RPA Nonmarket Values: Pricing Recreation in the National Forest System. Draft report under contract to EMC WO staff.

Watson, P., J. Wilson, D. Thilmany, and S. Winter. 2007. Determining Economic Contributions and Impacts: What is the difference and why do we care? The Journal of Regional Analysis and Policy. 37(2):1-15.

Alternative Objective Development

The revised forest plan contains a number of objectives that identify desired results to be achieved within the planning period to help meet plan goals. Most of these objectives remain constant across the action alternatives. However, in seven of these objectives, the results vary in the action alternatives. Table 25 contains a short discussion of those objectives and how they were varied across the alternatives for the analysis.

Table 25. Objectives to help meet plan goals and how they compare among the alternatives

Objective	Alternative variation	Rationale
Increase aspen cover type on #### acres using mechanical treatments.	B, D, E, F = 2,500 ac. C = 2,000 ac. G = 3,500 ac.	The 2,500-acre number for alternative B was the initial objective for the proposed action and was established by the interdisciplinary team based on the desired condition, current capability, and input from the public, including Wyoming Game and Fish, asking for an aggressive objective. Consideration for varying the number across the alternatives included suitable acres and generally accessible acres. The number is reduced in alternative C because of the addition of wilderness and a reduction in managed lands. In alternatives E and F, acres don't go up even though suitable acres are up. The reason is that there is more suitable land where commercial timber is a goal and there will be more pressure to favor conifer over aspen because aspen is not a commercial species. Alternative A does not have an objective. The objective was raised in alternative G. The objective was raised in response to public comment to further emphasize aspen and the climate change analysis, which indicates the area suitable for aspen expansion is likely to expand.
Restore ### acres of whitebark pine	A, B, D, E = 750 ac. C = 500 ac. F = 1,250 ac. G = 1,400 ac.	The 750 acres for alternative B was the initial objective for the proposed action. There is a desire for a higher objective, but until more rust-resistant planting stock is available, the interdisciplinary team felt a more measured approach is best. The variation across the alternatives is based on differences in suitable acres and generally accessible acres. The objective was raised in alternative G. The objective was raised in response to public comment to further emphasize whitebark pine and latest assessment from the interdisciplinary team that a higher objective is feasible.
Use treatments to reduce invasive plant species on #### acres	A, B, D, E, G = 2,000 ac. C = 1,500 ac. F = 3,000 ac.	The 2,000 acres for alternative B was the initial objective for the proposed action and is based on the level of treatment that is currently occurring. The variation across the alternatives was based on suitable acres and generally accessible acres. Mid-range alternatives are relatively close for these numbers, so only the more extreme alternatives were varied.
In management area categories 4, 5, and 8 hazardous fuels ratings are reduced on ##### to ##### acres.	A, B, C, D, G = 30,000 – 40,000 E = 35,000 – 45,000 F = 45,000 – 55,000	These numbers are based on accomplishments in the last 10 years. Budgets have generally been adequate for accomplishing this work in the last 10 years and it is felt that capacity (internally and externally) for accomplishing the work was the major limiting factor. Though there was a desire to consider increasing the level, given budget projections for the planning period, the interdisciplinary team does not project that it will be possible to increase capacity and it is very likely that available dollars will decrease. Alternative variation is based on a proration of acres tied to management area allocations, suitable acres, and generally accessible acres.

Table 25. Objectives to help meet plan goals and how they compare among the alternatives

Objective	Alternative variation	Rationale
Permitted animal unit months will range between plus or minus 10 percent of ##### animal units months.	A, B, D, G = 60,000 C = 35,000 E = 77,500 F = 81,500	60,000 AUMs for alternative B were the initial objective for the proposed action based on the permitted stocking levels for the last 10 years. Variations on the alternatives are based on changes in suitable acres, considering current stocking rates.
Annual timber sold averages ##### Ccf	A = 17,000 B, G = 16,500 C = 14,900 D = 15,900 E = 22,100 F = 30,500	These numbers are based on the spectrum analysis for the plan revision and are a function of suitable timber acres, management area allocations, and timber budget projections (see Spectrum analysis and budget projection sections).
At least # new, wheeled motorized trail loop opportunities are developed	B, G = 3 loops D = 1 loop E = 4 loops F = 8 loops	The 3 new loops for alternative B were the initial objective for the proposed action based on interdisciplinary team input considering budget levels. The remaining numbers were calculated by prorating based on management area acres open to motorized trail construction, alternative B having 3 new loops, and alternative C having 0 new loops.

Alternative Budget Level Projections

Alternative output projections take into consideration projected future budgets. The starting point for budgets was based on the forest average of the last 6 years (2006 to 2011). This cutoff was used because budgets prior to 2006 used different accounting to allocate administrative costs and numbers across the different resource program areas are not comparable. Though it is unknown what will happen with future budgets, it is likely, given the current state of the national budget, that the trend will be downward during at least the first part of the planning period. What happens in the latter half of the planning period is unknown. Other than the specific items mentioned below, the interdisciplinary team felt that a flat budget projection was the best way to do a comparative analysis of the alternatives. This flat budget is in line with alternative A – the no-action alternative. Most of the projected outputs in the alternatives are relatively close and could be produced under the flat budget scenario.

The interdisciplinary team did vary projected budget levels for three program areas in some alternatives, based on the assumption that the variation in the alternative would result in some redistribution of budget allocation.

The first of these is for the trails program. In alternative F, the large increase in acres allocated to back country motorized recreation is large enough that there would likely be a change in emphasis to building motorized trails that could not be accommodated within the current budget scenario. In alternative F, the projected budget for trails is doubled.

The other two items that are varied across the alternatives are the forest products program and planting costs with the vegetation and watershed management program. These budget items are usually varied based on opportunity for forest products program costs and need for planting costs under current budget processes. The forest products program was varied proportionally based on suitable timber acres in the alternatives. The planting program was varied based on harvest levels and associated planting needs in the alternatives. The current levels for these programs were indexed to alternatives A and B as the starting point.

Table 26 displays the projected budget scenarios for the alternatives.

Table 26. Project program budget levels for the alternatives (thousands of dollars)

Program area	2006-2001 average program budget	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G
Facilities Maintenance	$220	$220	$220	$220	$220	$220	$220	$220
Roads Capital Improvement	$720	$720	$720	$720	$720	$720	$720	$720
Trails Capital Improvement	$420	$420	$420	$420	$420	$420	$840	$420
Facilities Assessment	$180	$180	$180	$180	$180	$180	$180	$180
Inventory and Monitoring	$530	$530	$530	$530	$530	$530	$530	$530
Lands Ownership Management	$140	$140	$140	$140	$140	$140	$140	$140
Minerals and Geology	$50	$50	$50	$50	$50	$50	$50	$50
Land Management Planning	$350	$350	$350	$350	$350	$350	$350	$350
Grazing Management	$270	$270	$270	$270	$270	$270	$270	$270
Recreation, Heritage, Wilderness	$1,240	$1,240	$1,240	$1,240	$1,240	$1,240	$1,240	$1,240
Forest Products	$750	$750	$750	$680	$720	$1,000	$1,400	$750
Vegetation and Watershed Management	$700	$700	$700	$625	$700	$750	$840	$700
Wildlife and fish Management	$640	$640	$640	$640	$640	$640	$640	$640
Hazardous Fuels Reduction	$1,140	$1,140	$1,140	$1,140	$1,140	$1,140	$1,140	$1,140
Wildfire Preparedness	$1,230	$1,230	$1,230	$1,230	$1,230	$1,230	$1,230	$1,230
Administrative Management	$1,920	$1,920	$1,920	$1,920	$1,920	$1,920	$1,920	$1,920
TOTAL	$10,500	$10,500	$10,500	$10,355	$10,470	$10,800	$11,710	$10,500

Benchmark Analysis (new section)

A benchmark analysis was included in the Analysis of the Management Situation (AMS) to help guide the formulation of alternatives to the proposed action in the DEIS. A benchmark analysis provides baseline data to support the formulation of alternatives, and aids in defining the range within which alternatives can be constructed. Benchmarks estimate the Shoshone's physical, biological, and technical capabilities to produce goods and services. Benchmarks are focused on the revision topics and need for change.

In response to public comment, the Benchmark analysis was revisited between draft and final. There was a request for further discussion on monetary benchmarks and there was an overall desire to ensure the sufficiency of the benchmark analysis. During development of the alternatives in cooperation with the public and local governments some of the alternatives ended up outside of the range established by the

benchmarks. This was the result of some of the original constraints and assumptions used in the benchmark analysis being relaxed in the development of the alternatives. To remedy this situation the benchmark analysis was reviewed and reworked to make the assumptions consistent within the context of the suite of alternatives. In addition, acre allocations were recalculated using the latest GIS data used for the FEIS analysis.

Additional information is included here that was not available during the development of the alternatives. The new information is still consistent with the information presented in the DEIS that was used in crafting a range of alternatives. The information provides some additional numbers for comparison and ensures that the numbers are comparable between the benchmarks and the alternatives. In some cases numbers have been developed to supplement the descriptions used in the DEIS. There is no new information that changes the potential range of resource options considered in the DEIS.

For each benchmark, a scale is presented that shows where the alternatives fall within the decision space defined by each particular benchmark.

This presentation replaces the benchmark analysis in the AMS and was used to inform the decision maker's final decision.

Maximum timber

This benchmark represents the maximum potential area of the Shoshone that can be classified as suitable for timber production. Forest land not considered as suitable for timber production in this benchmark analysis includes land unavailable through statute or administrative action (such as wilderness), and lands defined as physically unsuitable for timber production such as non-forest lands, steep slopes, and high and low elevations sites. This benchmark represents the highest possible timber harvest volume consistent with the principles of non-declining flow and harvests that do not exceed the long-term sustained yield.

Table 27. Acre allocation for maximum timber benchmark

	Max Timber
Lands generally not suited for timber harvest	
Wilderness, Dunoir, High Lakes, wild river, RNA, SIA	1,418,000
Rock, steep slopes, Restocking not assured	346,300
Total lands generally not suited for timber harvest	1,764,300
Lands generally not suited for timber production	
Grass, shrub, noncommercial species, soil type	323,800
Total lands generally not suited for timber production	323,800
Lands generally suitable for timber production	
Suitable acres	349,900
Total lands generally suitable for timber production	349,900
Total Forest Acres	2,438,000

This acre allocation would result in an annual harvest that would average 64,875 Ccf during the next decade. The harvest for this benchmark is interpreted based upon the acre versus volume relationship represented in alternative F. The following scale displays how the alternatives fall relative to the maximum suitable acres represented by the timber benchmark.

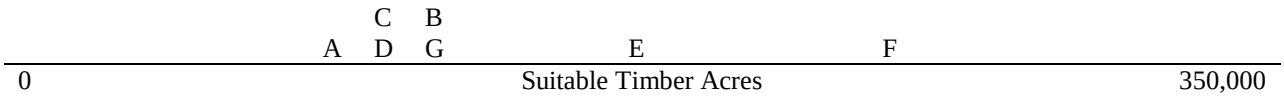

Figure 1. Relationship of suitable timber acres for each alternative to the maximum timber benchmark suitable acres

Maximum commercial livestock grazing

This benchmark represents the maximum potential area of the Shoshone that can be classified as suitable for commercial livestock grazing. National Forest System land not considered suitable for commercial livestock grazing in this benchmark analysis includes land removed through statute or administrative action (such as wilderness). Grazing that occurred when a wilderness was designated is included, but there is no expansion into wilderness that was not grazed at the time of designation. Allotments that preexisted wilderness and that are not currently being grazed are also included. In addition, lands defined as physically unsuitable for grazing such as steep slopes and rock are not included.

Table 28. Acres capable and suitable for livestock grazing in the maximum grazing benchmark

	Max Grazing
Capable acres	993,600
Suitable acres	416,200

This acre allocation would provide 61,670 AUMs of commercial grazing annually. The AUMs for this benchmark are interpreted based upon the acre versus AUM relationship represented in alternative F. The following scale displays how the alternatives fall relative to the AUMs represented by the grazing benchmark.

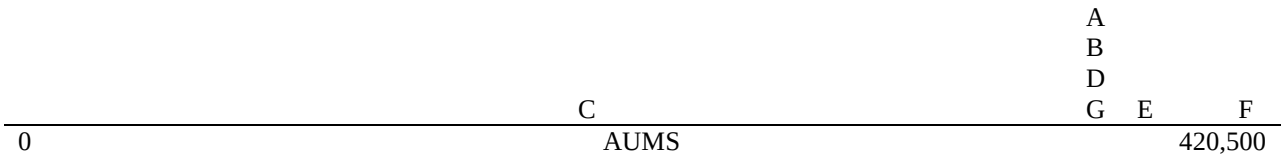

Figure 2. Relationship of AUMs for each alternative to the maximum grazing benchmark AUMs

Maximum oil and gas

This benchmark represents the maximum potential area of the Shoshone that would allow surface occupancy for oil and gas development. National Forest System land not considered as suitable for oil and gas development in this benchmark analysis includes land removed through statute. Those lands include designated wilderness, High Lake Wilderness Study Area, Dunoir Special Management Unit, and Clarks Fork Wild River which includes 1,416,200 acres in aggregate. The remaining 1,021,800 acres are suitable for surface occupancy under this benchmark.

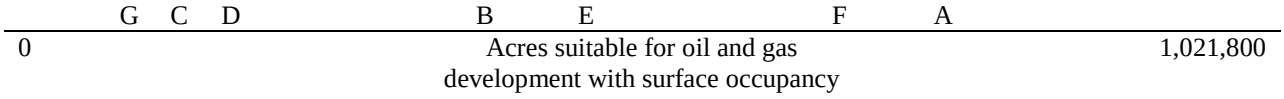

Figure 3. Relationship of acres suitable for surface occupancy for oil and gas development for each alternative to the maximum oil and gas benchmark

All of the alternatives have the same likelihood of oil and gas development given the low potential for development on the Shoshone. See the FEIS discussion for further information.

Maximum motorized summer recreation

This benchmark represents the maximum potential area of the Shoshone that can be classified as suitable for summer motorized recreation. National Forest System land not considered as suitable for summer motorized recreation in this benchmark includes land removed through statute or administrative action. Those lands include designated wilderness, High Lake Wilderness Study Area, Dunoir Special Management Unit, Line Creek RNA, and Swamp Lake SIA which includes 1,411,100 acres in aggregate. In addition, physically unsuitable lands (slopes greater than 40 percent), representing 322,300 acres are excluded. The remaining, 704,300 acres are identified as suitable for summer motorized recreation in this benchmark.

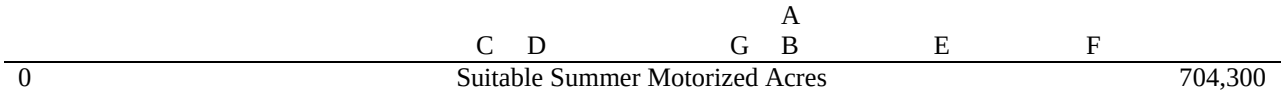

Figure 4. Relationship of acres suitable for summer motorized recreation for each alternative to the maximum summer recreation benchmark.

Maximum motorized winter recreation

This benchmark represents the maximum potential area of the Shoshone that can be classified as suitable for winter motorized recreation. National Forest System land not considered as suitable for winter motorized recreation in this benchmark includes land removed through statute or administrative action (such as wilderness). This also includes the portion of Line Creek Plateau Research Natural Area, which is not open to snowmobiling, designated wilderness, and the Dunoir Special Management Unit. This benchmark is also consistent with direction for the High Lakes Wilderness Study Area, which allows snowmobile use. Total acres suitable for winter motorized use in the benchmark is 1,042,800 acres.

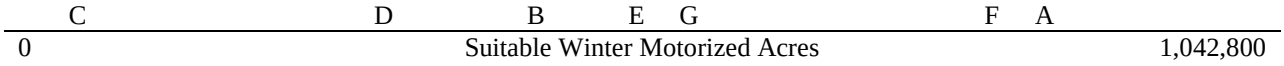

Figure 5. Relationship of acres suitable for winter motorized recreation for each alternative to the maximum winter recreation benchmark

Maximum non-motorized recreation

This benchmark represents the maximum potential area of the Shoshone that can be managed for summer non-motorized recreation. National Forest System land not considered as available for non-motorized recreation in this benchmark includes land already accessed by forest roads designed for passenger cars that are open to the public. The ROS inventory was used as the basis to make this calculation and to compare alternatives. The roaded natural category represents those lands that are within 0.5 mile of a road designed for passenger car use. For this benchmark, that represents 156,700 acres. The remaining acres amounting to 2,281,400 would be managed for non-motorized recreation in this benchmark.

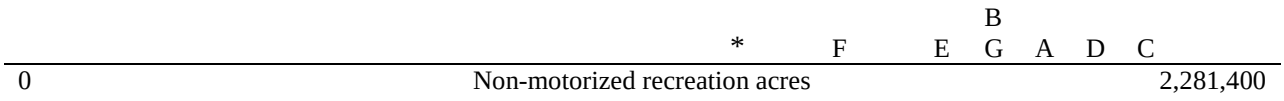

Figure 6. Relationship of acres of non-motorized recreation for each alternative to the maximum non-recreation motorized recreation benchmark

The asterisk (*) on the above scale represents that point at which designated wilderness acres fall on the scale.

Maximum recommended wilderness

This benchmark represents the maximum recommended wilderness areas for the Shoshone. All areas identified in the evaluation of potential wilderness are included, which amounts to 745,600 acres. Acres of existing wilderness are not included in the total, since they have already been designated.

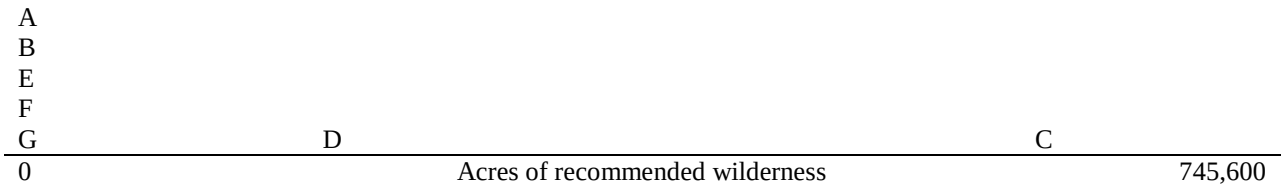

Figure 7. Relationship of acres of recommended wilderness for each alternative to the maximum recommended wilderness benchmark.

Maximum grazing and timber labor income

This benchmark represents the maximum labor income that would result from maximizing the use of the forest for grazing livestock and producing timber. It provides a surrogate for comparing the alternatives and their contributions to the markets for livestock and timber. The benchmark includes the acres allocations for the maximum grazing and maximum timber benchmarks. Labor income for the benchmark was interpreted based upon the labor income for alternative F in comparison to suitable acres allocations. For this benchmark the average annual labor income for the next decade associated with grazing and timber production would be $13,519,000.

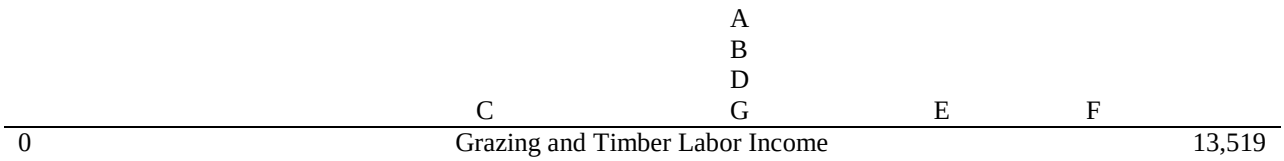

Figure 8. Relationship of grazing and timber income for each alternative to the maximum grazing and timber labor income benchmark.

Benchmark not analyzed

No monetary benchmarks were completed for the AMS. Some public comment on the DEIS noted this and requested that a maximum present net value benchmark be completed. They commenter cited both a desire to have the information to examine the range of alternatives and a concern that the lack of the benchmark would make the plan revision effort deficient.

In general, Region 2 policy used by other Forests in the region does not require monetary benchmarks to be completed for plan revision. The regional position is that they have limited utility. Theoretically, the information generated by such benchmarks would provide a solid focal point from which a decision

maker could evaluate economic opportunity costs and resource trade-offs. This is not the case. The allocation and scheduling models used in estimating these benchmarks are very sensitive to changes in the values used. Since the "assigned values" we use are often untenable based on the assumptions used, the results of these benchmark analyses do not provide a solid footing for making plan revision decisions.

The requirement to analyze these benchmarks assumes that an allocation/scheduling model can be built which adequately represents all resources having "an established market value or an assigned value." This is not the case. Our knowledge of the joint production functions within national forest ecosystems is not sufficient to adequately quantify all inputs and outputs as required in the deterministic models currently being used for forest planning analysis. This provides another reason for not relying on these benchmarks to provide meaningful information to the decision maker.

For these reasons, the decision maker has chosen to not produce a PNV benchmark. In order to address some of the public comment, a benchmark is included that represents the maximum labor income for grazing and timber. The interdisciplinary team feels that the information available to produce this benchmark is adequate to provide a meaningful comparison across the alternatives. This does not totally address the public comment since it does not include recreation outputs. As discussed elsewhere in the FEIS, the information to develop production functions for recreation outputs does not exist in a form that would allow for meaningful comparison of alternatives. In discussions with the public commenter, they were also unable to identify any information that could be used to conduct an analysis for recreation.

Another benchmark that was not completed was the minimum level benchmark which represents the least amount of management needed to maintain and protect the Shoshone as part of the National Forest System. The minimum level benchmark represents only those costs and outputs associated with protecting and managing activities and investments where there is little or no management discretion. Although incidental outputs are permissible, there will be no management action-related timber or recreation outputs. Forest vegetation will evolve through natural succession. The decision maker does not feel this benchmark is necessary to inform their decision.

Appendix C. Evaluation of Areas for Potential Wilderness, Shoshone National Forest

United States
Department of
Agriculture

Forest Service

Rocky Mountain Region

September 2013

Evaluation of Areas for Potential Wilderness

Shoshone National Forest

Version 4.0

First in the Nation

Shoshone
NATIONAL FOREST

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Introduction

This document describes the process used to evaluate the wilderness potential of 34 areas on the Shoshone National Forest.

Three tests—capability, availability, and need—were used to determine suitability as described in Forest Service Handbook 1909.12, chapter 70. In addition to the inherent wilderness qualities an area might possess, the area must provide opportunities and experiences that are dependent on and enhanced by a wilderness environment. The area and boundaries must allow the area to be managed as wilderness.

Capability is defined as the degree to which the area contains the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness.

The availability determination is conditioned on the value of and need for the wilderness resource compared to the value of and need for the area for other resources.

Need is the determination that the area should be designated as wilderness through an analysis of the degree the area contributes to the local, regional, and national distribution of wilderness.

The 2006 inventory conducted according to Forest Service Handbook 1909.12 chapter 70 is the basis for this evaluation. The inventory process, which identified 34 areas, is documented in appendix B.

Attachment A includes a summary of the capability, availability, and need assessments for areas on the Shoshone National Forest; appendix C contains descriptions of the areas identified in the 2006 inventory.

Capability

There are five basic characteristics identified to evaluate the capability of an area: natural environment, undeveloped, outstanding opportunities for solitude or primitive and unconfined recreation, special features and values, and manageability.

1. A natural environment's ecological systems are substantially free from the effects of modern civilization and generally appear to have been affected primarily by forces of nature. Factors to consider include the presence of non-native species and the health of ecosystems, plant communities, and plant species that are rare or at risk.
2. Undeveloped areas are without permanent improvements or human habitation. Measures include the level of human occupation and modification of the area including evidence of structures, construction, habitations, or other forms of human presence, use, and occupation.
3. Opportunities for solitude or primitive and unconfined recreation are measured by an area's vastness of scale, the degree of challenge and risk to users, and opportunities to experience isolation from the evidence of humans. A wide range of experiential opportunities includes physical and mental challenge, adventure and self-reliance, isolation, self-awareness, and feelings of solitude, and inspiration. Primitive-type recreation activities include hiking, backpacking, using pack and saddle stock, fishing, hunting, floating, kayaking, cross-country skiing, camping, and enjoying nature.
4. An area's special features and values are identified by determining its ecologic, geologic, scientific, educational, scenic, historical, or cultural significance. Examples include unique fish and wildlife species, unique plants or plant communities, connectivity, potential or existing research natural areas, outstanding landscape features, and significant cultural resource sites.

5. Manageability considers the ability of the Forest Service to manage the area as wilderness as required by the 1964 Wilderness Act. The area must be managed as an enduring resource of wilderness, untrammeled by humans, retaining its primeval character, with its natural character protected. Such factors as size, shape, and juxtaposition to external influences will be considered.

The combinations of basic natural characteristics are of infinite variety. No two areas possess any of the characteristics in the same measure. The process is to analyze the quality and quantity of these characteristics and determine if they can be provided by establishing management, protective, mitigation, or enhancement measures.

The capability process

To evaluate the five basic characteristics, they were broken down into elements, activities, or features that describe the basic characteristics and provide a basis for rating. At least two criteria were established for each element, activity, or feature. Since criteria were not of equal importance, criteria are in order of priority for each element, activity, or feature. Criteria were established to consider existing as well as future conditions both inside and adjacent to the area.

Shoshone National Forest resource specialists in soils, hydrology, fisheries biology, wildlife biology, and recreation evaluated each criteria, rating each as high, moderate, or low. Based on the ratings given in the first step and the heavier weighting of the initial criteria, each area was rated high, moderate, or low in capability. The elements and criteria are shown in table 1. Details of the capability assessment are shown in table 2.

Table 1. Capability assessment elements and criteria

1. Natural environment		
Variety and abundance of wildlife		
High	Moderate	Low
1. Diverse community of native mammals, birds, and fish. 2. Known high variety of threatened and endangered species. 3. Streams are critical to historic distribution of Yellowstone cutthroat trout. 4. Provides critical linkage between wildlife areas or habitats. 5. Noxious weeds are not evident. 6. High water quality. Fully supports beneficial uses.	1. Moderate variety of native mammals, birds, and fish. 2. Known moderate variety of threatened and endangered species. 3. Streams are important to historic distribution of Yellowstone cutthroat trout. 4. Provides linkage between wildlife areas or habitats. 5. Noxious weeds evident only along trails. 6. Good water quality. Partially supports beneficial uses.	1. Community of native mammals, birds, and fish is not diverse. 2. Low variety of threatened and endangered species. 3. Streams are not important to historic distribution of Yellowstone cutthroat trout. 4. Does not provide linkage between wildlife areas or habitats. 5. Noxious weeds common or scattered throughout the area. 6. Poor water quality. Does not support beneficial uses.

Table 1. Capability assessment elements and criteria

2. Undeveloped		
Natural and free from disturbance		
High	Moderate	Low
7. Area appears free of human disturbance. Disturbance appears to be natural, e.g., small wildfire. 8. Area visible in surrounding foreground (outside the area) may show some human disturbance but does not dominate the view. 9. Only a minor improvement, e.g., trail.	7. Area appears mostly free of human disturbance. Natural disturbance evident but does not dominate the landscape. 8. Area visible in surrounding foreground has signs of human activities, e.g., road, farm house. 9. Several minor improvements.	7. Area shows signs of human disturbance. Natural disturbance dominates the landscape, such as stand-replacing wildfire. 8. Area visible in surrounding foreground shows obvious human activities, e.g., clearcuts, town. 9. Major improvements, e.g., power line, dam, road.
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
High	Moderate	Low
10. Feeling of being alone or remote from civilization. 11. Recreation use by other parties is light.	10. Feeling of being alone is possible but signs of civilization are likely. 11. Recreation use by other parties is moderate.	10. Little opportunity of feeling alone. 11. Recreation use by other parties is high.
Provides challenge and adventure		
High	Moderate	Low
12. Terrain generally rugged. 13. Requires above average physical ability, knowledge, or skill to recreate safely in the area.	12. Terrain typical for general forest area. 13. Requires similar physical ability, knowledge, or skill as the general forest area.	12. Terrain more gentle and rolling. 13. Area easily accessible. Requires average physical ability, limited knowledge and skill as compared to abilities required in the general forest area.
Hiking/backpacking opportunities		
High	Moderate	Low
14. Two or more mainline trails. 15. Terrain is gentle and vegetation open to allow easy cross-country travel 16. Several dispersed camping sites that are routinely used.	14. At least one secondary trail that is routinely maintained. 15. Terrain is moderate or vegetation brushy that impedes cross-country travel. 16. At least one dispersed camping site that is occasionally used.	14. No system trails that are maintained. 15. Terrain is steep or vegetation too dense (including down material) that cross-country travel is difficult. 16. No dispersed camping sites that are used, but progressive camping may occur.
Saddle stock opportunities		
High	Moderate	Low
17. At least one mainline trail designed for saddle stock. 18. Trailhead has stock facilities, such as unloading ramp.	17. At least one secondary trail that is suitable for saddle stock and routinely maintained. 18. Trailhead has room to turn around stock truck or trailer.	17. No system trails that are maintained. 18. Trailhead does not support use of stock.

Table 1. Capability assessment elements and criteria

Hunting opportunities		
High	Moderate	Low
19. Good populations of big game animals or fair population of permitted animals, such as sheep or goats. 20. Terrain is gentle and vegetation open to allow easy hunting access off trails and ridges.	19. Fair populations of game animals. 20. Terrain is moderately steep or vegetation brushy that limits hunting on much of the area.	19. Scattered small herds of big game animals. 20. Terrain is steep or vegetation too dense that hunting is limited to trails or ridges.
Fishing opportunities		
High	Moderate	Low
21. Good populations of native game fish. 22. Stream bottoms are generally gentle with minor brush, allowing access to water.	21. Fair populations of native game fish. 22. Stream channel has enough brush to limit access. Channel bottoms or side slopes not overly steep.	21. Low populations of native game fish. 22. Stream channels steep, or steep rocky side slopes, or brush along channels, making access difficult.
Skiing and snowshoeing opportunities		
High	Moderate	Low
23. Terrain is gentle and vegetation open to allow easy cross-country travel. 24. Easily accessible in winter by motorized wheeled vehicles.	23. Terrain is moderate or vegetation brushy that impedes cross-country travel. 24. Snow keeps wheeled vehicles several miles from area, but access is possible by snowmobile.	23. Terrain is steep or vegetation too dense that cross-country travel is difficult. 24. Area is difficult or rarely accessed by snowmobile.
Snowmobiling opportunities		
High	Moderate	Low
25. Terrain is steep or vegetation too dense that cross-country travel is difficult. 26. Snowmobile use prohibited, or if allowed, rarely used.	25. Terrain is moderate or vegetation brushy that impedes cross-country travel. 26. Snowmobile use restricted to two months or less, or on half or less of the area.	25. Terrain is gentle and vegetation open to allow easy cross-country travel. 26. Snowmobile use permitted.
4. Special features and values		
Scenic features		
High	Moderate	Low
27. Area has peaks or rocky formations considered spectacular from the rest of the Forest and/or special vegetative features that are considered very scenic. 28. Area has alpine lakes, creeks in alpine meadows, or waterfalls.	27. Area has a peak or formation that stands out from surrounding terrain and/or vegetative features considered scenic. 28. Area may have bodies of water that are typical for the Forest.	27. Terrain is typical of the Forest or surrounding area and vegetation is common to the surrounding area. 28. Area has no permanent lakes but may have perennial creeks or ponds.

Table 1. Capability assessment elements and criteria

Other special features		
High	Moderate	Low
29. Area has at least one major other special feature, e.g., high mountain meadow, fen, etc. 30. Contains a designated special area, e.g., wild and scenic river, research natural area, etc.	29. Several minor other special features, e.g., flat creek bottom, small waterfall, etc. 30. Contains a candidate or eligible special area, e.g., wild and scenic river, research natural area, etc.	29. No major or very few minor other special features. 30. Does not contain an established, candidate, or eligible special area.
Scientific, educational, or historical values		
High	Moderate	Low
31. Several significant scientific, educational, or historical values have been identified in the area. 32. Identified values are unique to the region.	31. At least one significant or several minor scientific, educational, or historical values have been identified in the area. 32. Identified values are common in the region but uncommon on the Forest.	31. No scientific, educational, or historical value has been identified in the area. 32. Any identified values are common throughout the Forest and the region.
5. Manageability		
Manageable		
High	Moderate	Low
33. Size and shape of area allows effective management. 34. Minimum activity in surrounding area that affects manageability. 35. Located adjacent to existing wilderness or other inventoried areas.	33. Size or shape will affect manageability but can be mitigated by boundary changes. 34. Activity is evident and ongoing in surrounding area but will not keep area from being managed. 35. Located near existing wilderness or other inventoried areas. May be difficult to access.	33. Size is small or has irregular shape that makes management difficult. 34. Activity in surrounding area will affect the manageability of the inventoried area. 35. Isolated, small parcel of land.
Area boundaries are recognizable		
High	Moderate	Low
36. The vast majority of the boundary follows features that can be easily found and identified on the ground, e.g., dominant ridge, creek, road, or trail. 37. Boundary can be easily adjusted to follow locatable and identifiable features without significantly modifying the area boundaries.	36. More than half the boundary follows a feature that can be easily found and identified on the ground. 37. Boundary can be adjusted to follow locatable and identifiable features but will modify the general size and shape of the area. Boundary may be identified with minimal signing.	36. Boundary generally lies across the hillside and can rarely be located without equipment, e.g., GPS unit. 37. Boundary cannot be adjusted to follow locatable and identifiable features, or requires extensive signing.

Table 1. Capability assessment elements and criteria

Area boundaries are manageable		
High	Moderate	Low
38. Area access by trail or closed and revegetated road, adjacent area has natural setting. 39. Boundary totally on national forest and not adjacent to private property. 40. No inholdings.	38. May be accessed by narrow or two-track open road that is lightly traveled, minimal human presence evident. 39. Boundary follows property line forming irregular shape. 40. Few small inholdings may be present.	38. Boundary adjacent to heavily used road or along area showing high human presence, e.g., a number of farm houses with outbuilding, pasture land, etc. 39. Boundary crosses private property so there are inholdings along the boundary. 40. Several small or one large inholding.
Area boundaries constitute barrier to prohibited use		
High	Moderate	Low
41. Topographic features provide a natural barrier, e.g., major stream or steep hill side. 42. Human improvement is significant to physically provide a barrier, e.g., road cut slope.	41. Topography generally makes it difficult to participate in prohibited use. 42. Human improvement places user on notice of prohibited use, e.g., a sign.	41. Topography not a deterrent to prohibited use. 42. Human improvement not a deterrent; may provide point of access of prohibited use.

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Windy Mountain 02039		
1. Natural environment		
Ecological systems		
1. Native animals	low	moderate
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	moderate	
6. Water Quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	moderate	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	moderate	moderate
11. Recreation use by other parties	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	moderate	
Hiking/backpacking opportunities		
14. Trails	high	moderate
15. Terrain	low	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	high	high
18. Trailhead facilities	high	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	moderate	
Fishing opportunities		
21. Game fish populations	low	low
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	moderate	
Snowmobiling opportunities		
25. Terrain	moderate	moderate
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	low	
Other special features		
29. Other special features	moderate	moderate
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	low	
Windy Mountain 02039		
5. Manageability		
Manageable		
33. Size and shape	low	moderate
34. Surrounding area	low	
35. Location	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Area boundaries are recognizable		
36. Identifiable on the ground	low	low
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	low	moderate
39. Adjacent property	moderate	
40. Inholdings	moderate	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	low	
Pat O'Hara 02040		
1. Natural environment		
Ecological systems		
1. Native animals	low	moderate
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	moderate	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	high	
9. Improvements	high	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	moderate	moderate
11. Recreation use by other parties	low	
Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	high	
Hiking/Backpacking opportunities		
14. Trails	moderate	moderate
15. Terrain	moderate	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	moderate	moderate
18. Trailhead facilities	low	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	low	low
22. Stream variables	low	
Pat O'Hara 02040		
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	moderate	
Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	low	
Other special features		
29. Other special features	moderate	moderate
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	low	
5. Manageability		
Manageable		
33. Size and shape	high	high
34. Surrounding area	moderate	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	moderate
39. Adjacent property	high	
40. Inholdings	moderate	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	

Sulphur Creek 02041		
1. Natural environment		
Ecological systems		
1. Native animals	low	moderate
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	moderate	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	moderate	
9. Improvements	high	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	
Sulphur Creek 02041		
Provides challenge and adventure		
12. Terrain	moderate	high
13. Ability, knowledge, skill	high	
Hiking opportunities		
14. Trails	high	high
15. Terrain	low	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	high	high
18. Trailhead facilities	high	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	low	low
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	low	moderate
24. Area access	high	
Snowmobiling opportunities		
25. Terrain	low	moderate
26. Use restrictions	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	low	
Other special features		
29. Other special features	high	moderate
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	low	
5. Manageability		
Manageable		
33. Size and shape	high	high
34. Surrounding area	moderate	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	moderate
39. Adjacent property	moderate	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	
Clarks Fork 02042		
1. Natural environment		
Ecological systems		
1. Native animals	low	moderate
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	moderate	
9. Improvements	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	high	high
15. Terrain	moderate	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	high	high
18. Trailhead facilities	high	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	high	high
24. Area access	moderate	
Snowmobiling opportunities		
25. Terrain	moderate	moderate
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	high	high
28. Water features	high	
Other special features		
29. Other special features	high	high
30. Designated special area(s)	high	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	high	

Clarks Fork 02042		
5. Manageability		
Manageable		
33. Size and shape	high	high
34. Surrounding area	high	
35. Location	moderate	
Area boundaries are recognizable		
36. Identifiable on the ground	high	high
37. Boundary adjustment	high	
Area boundaries are manageable		
38. Area access	moderate	moderate
39. Adjacent property	high	
40. Inholdings	moderate	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	low	
Sunlight 02043		
1. Natural environment		
Ecological systems		
1. Native animals	low	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious Weeds	high	
6. Water Quality	high	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	moderate	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	moderate	moderate
11. Recreation use by other parties	moderate	
Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	high	
Hiking/Backpacking opportunities		
14. Trails	moderate	moderate
15. Terrain	low	
16. Dispersed camping	low	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Saddle stock opportunities		
17. Trails	moderate	moderate
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	low	low
22. Stream variables	moderate	
Sunlight 02043		
Skiing and snowshoeing opportunities		
23. Terrain	low	low
24. Area access	moderate	
Snowmobiling opportunities		
25. Terrain	high	moderate
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	high	
Other special features		
29. Other special features	moderate	moderate
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	moderate	
5. Manageability		
Manageable		
33. Size and shape	low	low
34. Surrounding area	low	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	moderate
39. Adjacent property	high	
40. Inholdings	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Area boundaries constitute barrier to prohibited use		
41. Topographic feature	high	moderate
42. Human improvement	low	
Trout Creek 02044		
1. Natural environment		
Ecological systems		
1. Native animals	high	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	moderate	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	high	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	high	high
8. Visible foreground	moderate	
9. Improvements	high	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	
Trout Creek 02044		
Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	high	
Hiking/Backpacking opportunities		
14. Trails	high	high
15. Terrain	moderate	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	high	high
18. Trailhead facilities	high	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	low	
Snowmobiling opportunities		
25. Terrain	high	moderate
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	high	high
28. Water features	high	
Other special features		
29. Other special features	high	high
30. Designated special area(s)	moderate	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	moderate	
5. Manageability		
Manageable		
33. Size and shape	high	high
34. Surrounding area	moderate	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	high	
Area boundaries are manageable		
38. Area access	moderate	moderate
39. Adjacent property	moderate	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	high	high
42. Human improvement	moderate	

Wapiti Valley North 02045		
1. Natural environment		
Ecological systems		
1. Native animals	high	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	moderate	
4. Habitat linkage	high	
5. Noxious weeds	low	
6. Water quality	high	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	moderate	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	low	low
11. Recreation use by other parties	moderate	
Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	high	moderate
15. Terrain	low	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	high	high
18. Trailhead facilities	high	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	low	moderate
24. Area access	high	
Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

4. Special features and values		
Scenic features		
27. Terrain features	high	high
28. Water features	moderate	
Other special features		
29. Other special features	high	high
30. Designated special area(s)	moderate	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	moderate	
Wapiti Valley North 02045		
5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	low	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	high	high
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38.Area access	low	moderate
39. Adjacent property	high	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	low	
Rattlesnake 02046		
1. Natural environment		
Ecological systems		
1. Native animals	low	moderate
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	high	high
8. Visible foreground	moderate	
9. Improvements	high	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	low	low
11. Recreation use by other parties	low	
Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	high	
Hiking/Backpacking opportunities		
14. Trails	low	low
15. Terrain	low	
16. Dispersed camping	low	
Saddle stock opportunities		
17. Trails	low	low
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	low	low
22. Stream variables	moderate	
Rattlesnake 02046		
Skiing and snowshoeing opportunities		
23. Terrain	low	low
24. Area access	low	
Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	low	
Other special features		
29. Other special features	moderate	moderate
30. Designated special area(s)	low	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Scientific, educational, or historical values		
31. Value presence	low	low
32. Value uniqueness	low	
5. Manageability		
Manageable		
33. Size and shape	low	low
34. Surrounding area	low	
35. Location	low	
Area boundaries are recognizable		
36. Identifiable on the ground	high	high
37. Boundary adjustment	high	
Area boundaries are manageable		
38. Area access	moderate	moderate
39. Adjacent property	moderate	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	high	high
42. Human improvement	moderate	
Wapiti Valley South 02048		
1. Natural environment		
Ecological systems		
1. Native animals	high	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	moderate	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	high	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	moderate	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Wapiti Valley South 02048		
Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	high	
Hiking/Backpacking opportunities		
14. Trails	high	high
15. Terrain	moderate	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	high	high
18. Trailhead facilities	high	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	low	moderate
24. Area access	high	
Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	moderate	
Other special features		
29. Other special features	high	high
30. Designated special area(s)	moderate	
Scientific, educational, or historical values		
31. Value presence	high	high
32. Value uniqueness	high	
5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	moderate	
35. Location	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	high
39. Adjacent property	high	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	high	high
42. Human improvement	moderate	
South Fork 02049		
1. Natural environment		
Ecological systems		
1. Native animals	moderate	moderate
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	moderate	
4. Habitat linkage	high	
5. Noxious weeds	low	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	moderate	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	
Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	high	
Hiking/Backpacking opportunities		
14. Trails	high	moderate
15. Terrain	low	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	high	high
18. Trailhead facilities	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	moderate	moderate
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	low	moderate
24. Area access	high	
Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	moderate	
Other special features		
29. Other special features	moderate	moderate
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	moderate	
South Fork 02049		
5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	moderate	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	moderate
39. Adjacent property	moderate	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Carter Mountain 02050		
1. Natural environment		
Ecological systems		
1. Native animals	moderate	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	moderate	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	high	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	low	low
8. Visible foreground	moderate	
9. Improvements	low	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	low	moderate
11. Recreation use by other parties	moderate	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	low	moderate
15. Terrain	high	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	low	low
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Carter Mountain 02050		
Fishing opportunities		
21. Game fish populations	moderate	moderate
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Snowmobiling opportunities		
25. Terrain	moderate	moderate
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	low	low
28. Water features	low	
Other special features		
29. Other special features	low	low
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	low	low
32. Value uniqueness	low	
5. Manageability		
Manageable		
33. Size and shape	low	low
34. Surrounding area	low	
35. Location	low	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	moderate
39. Adjacent property	low	
40. Inholdings	moderate	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	low	low
42. Human improvement	moderate	
Franc's Peak 02051		
1. Natural environment		
Ecological systems		
1. Native animals	high	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	high	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	high	high
8. Visible foreground	high	
9. Improvements	moderate	
Franc's Peak 02051		
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	
Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	high	
Hiking/Backpacking opportunities		
14. Trails	high	high
15. Terrain	moderate	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	high	high
18. Trailhead facilities	high	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	moderate	moderate
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	low	low
24. Area access	moderate	
Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	moderate	
4. Special features and values		
Scenic features		
27. Terrain features	high	high
28. Water features	high	
Other special features		
29. Other special features	high	high
30. Designated special area(s)	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Scientific, educational, or historical values		
31. Value presence	high	high
32. Value uniqueness	moderate	
5. Manageability		
Manageable		
33. Size and shape	high	high
34. Surrounding area	high	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	high	high
39. Adjacent property	moderate	
40. Inholdings	high	
Franc's Peak 02051		
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	high	high
42. Human improvement	moderate	
Wood River 02052		
1. Natural environment		
Ecological systems		
1. Native animals	high	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	high	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	high	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	high	high
8. Visible foreground	high	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	high	
Hiking/Backpacking opportunities		
14. Trails	high	high
15. Terrain	moderate	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	moderate	moderate
18. Trailhead facilities	moderate	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	low	
Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	moderate	
Other special features		
29. Other special features	moderate	moderate
30. Designated special area(s)	moderate	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	moderate	
5. Manageability		
Manageable		
33. Size and shape	high	high
34. Surrounding area	high	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Area boundaries are manageable		
38. Area access	high	high
39. Adjacent property	moderate	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	
Castle Rock 02053		
1. Natural environment		
Ecological systems		
1. Native animals	moderate	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	moderate	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	high	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	high	high
8. Visible foreground	high	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other users	high	
Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	high	
Hiking/Backpacking opportunities		
14. Trails	low	moderate
15. Terrain	moderate	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	low	low
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Castle Rock 02053		
Fishing opportunities		
21. Game fish populations	moderate	moderate
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	low	low
24. Area access	low	
Snowmobiling opportunities		
25. Terrain	moderate	moderate
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	low	
Other special features		
29. Other special features	low	low
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	low	
5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	moderate	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	
39. Adjacent property	moderate	moderate
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Telephone Draw 02054		
1. Natural environment		
Ecological systems		
1. Native animals	high	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	moderate	
4. Habitat linkage	high	
5. Noxious weeds	moderate	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	high	
9. Improvements	moderate	
Telephone Draw 02054		
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	moderate	moderate
15. Terrain	moderate	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	moderate	moderate
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	moderate	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	low	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Snowmobiling opportunities		
25. Terrain	moderate	moderate
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	high	high
28. Water features	high	
Other special features		
29. Other special features	moderate	moderate
30. Designated special area(s)	moderate	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	high	
5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	moderate	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	high	high
37. Boundary adjustment	high	
Area boundaries are manageable		
38. Area access	moderate	moderate
39. Adjacent property	moderate	
40. Inholdings	high	
Telephone Draw 02054		
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	
Carson Lake 02055		
1. Natural environment		
Ecological systems		
1. Native animals	high	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	moderate	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	high	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	moderate	moderate
11. Recreation use by other parties	moderate	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	high	moderate
15. Terrain	low	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	moderate	moderate
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	moderate
20. Terrain	low	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	low	low
24. Area access	low	
Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	low	low
28. Water features	moderate	
Other special features		
29. Other special features	low	low
30. Designated special area(s)	low	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Scientific, educational, or historical values		
31. Value presence	low	low
32. Value uniqueness	low	
5. Manageability		
Manageable		
33. Size and shape	low	moderate
34. Surrounding area	moderate	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	low	low
37. Boundary adjustment	low	
Area boundaries are manageable		
38. Area access	moderate	
39. Adjacent property	high	high
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	low	
East Dunoir 02056		
1. Natural environment		
Ecological systems		
1. Native animals	high	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	high	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	moderate	moderate
11. Recreation use by other parties	moderate	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Hiking/Backpacking opportunities		
14. Trails	moderate	moderate
15. Terrain	low	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	moderate	moderate
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	moderate
20. Terrain	low	
East Dunoir 02056		
Fishing opportunities		
21. Game fish populations	low	low
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	low	low
24. Area access	low	
Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	high	moderate
28. Water features	low	
Other special features		
29. Other special features	moderate	moderate
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	high	
5. Manageability		
Manageable		
33. Size and shape	low	moderate
34. Surrounding area	moderate	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	high	high
37. Boundary adjustment	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Area boundaries are manageable		
38. Area access	moderate	moderate
39. Adjacent property	moderate	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	high	high
42. Human improvement	moderate	
South Dunoir 02057		
1. Natural environment		
Ecological systems		
1. Native animals	high	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	moderate	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	high	
9. Improvements	moderate	
South Dunoir 02057		
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	moderate	moderate
11. Recreation use by other parties	high	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	high	high
15. Terrain	high	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	high	moderate
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Fishing opportunities		
21. Game fish populations	moderate	moderate
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	high	moderate
24. Area access	low	
Snowmobiling opportunities		
25. Terrain	low	moderate
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	low	low
28. Water features	low	
Other special features		
29. Other special features	low	low
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	high	
5. Manageability		
Manageable		
33. Size and shape	low	low
34. Surrounding area	low	
35. Location	moderate	
Area boundaries are recognizable		
36. Identifiable on the ground	low	low
37. Boundary adjustment	low	
Area boundaries are manageable		
38. Area access	high	high
39. Adjacent property	moderate	
40. Inholdings	high	
South Dunoir 02057		
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	low	moderate
42. Human improvement	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Dunoir 02058		
1. Natural environment		
Ecological systems		
1. Native animals	high	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	moderate	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	high	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	moderate	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	high	high
15. Terrain	moderate	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	high	moderate
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	high	moderate
24. Area access	low	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Snowmobiling opportunities		
25. Terrain	low	moderate
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	high	high
28. Water features	high	
Dunoir 02058		
Other special features		
29. Other special features	high	high
30. Designated special area(s)	high	
Scientific, educational, or historical values		
31. Value presence	high	high
32. Value uniqueness	high	
5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	moderate	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	low	
Area boundaries are manageable		
38. Area access	high	high
39. Adjacent property	high	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	high	
West Dunoir 02059		
1. Natural environment		
Ecological systems		
1. Native animals	high	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	moderate	
5. Noxious weeds	high	
6. Water quality	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	high	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	moderate	moderate
11. Recreation use by other parties	moderate	
Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	moderate	moderate
15. Terrain	low	
16. Dispersed camping	low	
Saddle stock opportunities		
17. Trails	moderate	moderate
18. Trailhead facilities	low	
West Dunoir 02059		
Hunting opportunities		
19. Big game populations	high	moderate
20. Terrain	low	
Fishing opportunities		
21. Game fish populations	low	low
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	low	low
24. Area access	moderate	
Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	high	moderate
28. Water features	low	
Other special features		
29. Other special features	high	moderate
30. Designated special area(s)	low	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	low	
5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	low	
35. Location	moderate	
Area boundaries are recognizable		
36. Identifiable on the ground	low	low
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	low	moderate
39. Adjacent property	high	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	
Sheridan Pass 02060		
1. Natural environment		
Ecological systems		
1. Native animals	high	moderate
2. Threatened and endangered species	moderate	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	high	high
8. Visible foreground	high	
9. Improvements	moderate	
Sheridan Pass 02060		
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	moderate	moderate
11. Recreation use by other parties	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	moderate	moderate
15. Terrain	moderate	
16. Dispersed camping	low	
Saddle stock opportunities		
17. Trails	moderate	moderate
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	moderate
20. Terrain	low	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	moderate	
Snowmobiling opportunities		
25. Terrain	moderate	moderate
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	moderate	
Other special features		
29. Other special features	low	moderate
30. Designated special area(s)	high	
Scientific, educational, or historical values		
31. Value presence	high	moderate
32. Value uniqueness	low	
5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	high	
35. Location	low	
Area boundaries are recognizable		
36. Identifiable on the ground	low	low
37. Boundary adjustment	low	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Area boundaries are manageable		
38. Area access	moderate	high
39. Adjacent property	high	
40. Inholdings	high	
Sheridan Pass 02060		
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	low	low
42. Human improvement	moderate	
Benchmark 02061		
1. Natural environment		
Ecological systems		
1. Native animals	high	moderate
2. Threatened and endangered species	moderate	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	moderate	
5. Noxious weeds	high	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	high	high
8. Visible foreground	high	
9. Improvements	high	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking opportunities		
14. Trails	moderate	moderate
15. Terrain	moderate	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	moderate	moderate
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Fishing opportunities		
21. Game fish populations	low	low
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	low	
Snowmobiling opportunities		
25. Terrain	moderate	moderate
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	low	low
28. Water features	moderate	
Other special features		
29. Other special features	moderate	moderate
30. Designated special area(s)	moderate	
Benchmark 02061		
Scientific, educational, or historical values		
31. Value presence	low	low
32. Value uniqueness	low	
5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	moderate	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	moderate
39. Adjacent property	moderate	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Salt Creek 02062		
1. Natural environment		
Ecological systems		
1. Native animals	high	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	moderate	
5. Noxious weeds	high	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	high	
9. Improvements	low	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	moderate	moderate
11. Recreation use by other parties	moderate	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	moderate	moderate
15. Terrain	moderate	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	moderate	moderate
18. Trailhead facilities	low	
Salt Creek 02062		
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	moderate	
Fishing opportunities		
21. Game fish populations	moderate	moderate
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Snowmobiling opportunities		
25. Terrain	moderate	moderate
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	low	low
28. Water features	low	
Other special features		
29. Other special features	low	moderate
30. Designated special area(s)	high	
Scientific, educational, or historical values		
31. Value presence	low	low
32. Value uniqueness	low	
5. Manageability		
Manageable		
33. Size and shape	low	low
34. Surrounding area	high	
35. Location	low	
Area boundaries are recognizable		
36. Identifiable on the ground	low	low
37. Boundary adjustment	low	
Area boundaries promote remoteness		
Area boundaries are manageable		
38. Area access	moderate	
39. Adjacent property	high	high
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	low	low
42. Human improvement	low	
Little Popo Agie 02064		
1. Natural environment		
Ecological systems		
1. Native animals	high	moderate
2. Threatened and endangered species	low	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	low	moderate
8. Visible foreground	moderate	
9. Improvements	moderate	
Little Popo Agie 02064		
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	
Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	high	
Hiking/Backpacking opportunities		
14. Trails	low	low
15. Terrain	low	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	low	low
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	moderate
20. Terrain	low	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	low	low
24. Area access	low	
Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Other special features		
29. Other special features	high	high
30. Designated special area(s)	moderate	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	high	
5. Manageability		
Manageable		
33. Size and shape	low	low
34. Surrounding area	low	
35. Location	low	
Area boundaries are recognizable		
36. Identifiable on the ground	high	high
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	high
39. Adjacent property	high	
40. Inholdings	high	
Little Popo Agie 02064		
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	
Canyon Creek 02065		
1. Natural environment		
Ecological systems		
1. Native animals	moderate	moderate
2. Threatened and endangered species	low	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	moderate	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
5. Free of disturbance	high	high
6. Visible foreground	high	
7. Improvements	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	low	moderate
15. Terrain	moderate	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	low	low
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	moderate	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	low	
Snowmobiling opportunities		
25. Terrain	moderate	moderate
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	low	low
28. Water features	moderate	
Other special features		
29. Other special features	low	low
30. Designated special area(s)	moderate	
Scientific, educational, or historical values		
31. Value presence	high	high
32. Value uniqueness	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	high	
35. Location	low	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	high
39. Adjacent property	high	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	
Pass Creek 02066		
1. Natural environment		
Ecological systems		
1. Native animals	high	moderate
2. Threatened and endangered species	low	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	low	moderate
8. Visible foreground	moderate	
9. Improvements	high	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Hiking/Backpacking opportunities		
14. Trails	low	low
15. Terrain	moderate	
16. Dispersed camping	low	
Saddle stock opportunities		
17. Trails	low	low
18. Trailhead facilities	low	
Pass Creek 02066		
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	moderate	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	low	
Snowmobiling opportunities		
25. Terrain	moderate	moderate
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	low	low
28. Water features	moderate	
Other special features		
29. Other special features	low	low
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	high	high
32. Value uniqueness	moderate	
5. Manageability		
Manageable		
33. Size and shape	low	low
34. Surrounding area	moderate	
35. Location	low	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Area boundaries are manageable		
38. Area access	low	moderate
39. Adjacent property	high	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	
Middle Fork 02901		
1. Natural environment		
Ecological systems		
1. Native animals	high	moderate
2. Threatened and endangered species	moderate	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	moderate	
6. Water quality	high	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	moderate	
9. Improvements	low	
Middle Fork 02901		
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	high	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	high	high
15. Terrain	moderate	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	high	high
18. Trailhead facilities	high	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	low	
Snowmobiling opportunities		
25. Terrain	high	moderate
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	high	
Other special features		
29. Other special features	moderate	moderate
30. Designated special area(s)	moderate	
Scientific, educational, or historical values		
31. Value presence	high	high
32. Value uniqueness	high	
5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	moderate	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	low	moderate
39. Adjacent property	moderate	
40. Inholdings	high	
Middle Fork 02901		
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Warm Spring Creek 02902		
1. Natural environment		
Ecological systems		
1. Native animals	high	moderate
2. Threatened and endangered species	moderate	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	moderate	
5. Noxious weeds	high	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	high	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	moderate	moderate
11. Recreation use by other parties	moderate	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	low	moderate
15. Terrain	high	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	low	low
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	high	high
24. Area access	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Snowmobiling opportunities		
25. Terrain	low	low
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	high	
Other special features		
29. Other special features	low	low
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	low	low
32. Value uniqueness	low	
5. Manageability		
Manageable		
33. Size and shape	high	high
34. Surrounding area	high	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	high	high
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	high
39. Adjacent property	high	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	low	low
42. Human improvement	moderate	
Togwotee Pass 02903		
1. Natural environment		
Ecological systems		
1. Native animals	moderate	moderate
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	moderate	
4. Habitat linkage	moderate	
5. Noxious weeds	high	
6. Water quality	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	low	low
8. Visible foreground	low	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	low	low
11. Recreation use by other parties	low	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	high	high
15. Terrain	high	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	high	moderate
18. Trailhead facilities	low	
Togwotee Pass 02903		
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	moderate	
Snowmobiling opportunities		
25. Terrain	moderate	moderate
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	high	high
28. Water features	high	
Other special features		
29. Other special features	high	high
30. Designated special area(s)	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Scientific, educational, or historical values		
31. Value presence	high	high
32. Value uniqueness	high	
5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	low	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	high	high
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	low	moderate
39. Adjacent property	high	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	high	high
42. Human improvement	moderate	
Deep Lake 02911		
1. Natural environment		
Ecological systems		
1. Native animals	low	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	high	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	high	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	high	
9. Improvements	moderate	
Deep Lake 02911		
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	high	high
11. Recreation use by other parties	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Provides challenge and adventure		
12. Terrain	low	low
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	high	high
15. Terrain	high	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	high	high
18. Trailhead facilities	moderate	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	high	high
24. Area access	moderate	
Snowmobiling opportunities		
25. Terrain	high	moderate
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	high	high
28. Water features	high	
Other special features		
29. Other special features	high	high
30. Designated special area(s)	moderate	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	high	
5. Manageability		
Manageable		
33. Size and shape	high	high
34. Surrounding area	high	
35. Location	moderate	
Area boundaries are recognizable		
36. Identifiable on the ground	high	high
37. Boundary adjustment	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Area boundaries are manageable		
38. Area access	high	high
39. Adjacent property	moderate	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	low	low
42. Human improvement	moderate	
North Boundary 02913		
1. Natural environment		
Ecological systems		
1. Native animals	low	low
2. Threatened and endangered species	low	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	low	
5. Noxious weeds	high	
6. Water quality	high	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	moderate	
9. Improvements	high	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	low	moderate
11. Recreation use by other parties	high	
Provides challenge and adventure		
12. Terrain	high	high
13. Ability, knowledge, skill	high	
Hiking/Backpacking opportunities		
14. Trails	low	low
15. Terrain	low	
16. Dispersed camping	low	
Saddle stock opportunities		
17. Trails	low	low
18. Trailhead facilities	low	
Hunting opportunities		
19. Big game populations	low	moderate
20. Terrain	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Fishing opportunities		
21. Game fish populations	low	low
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	low	low
24. Area access	moderate	
Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	low	
Other special features		
29. Other special features	low	low
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	low	low
32. Value uniqueness	low	
North Boundary 02913		
5. Manageability		
Manageable		
33. Size and shape	low	low
34. Surrounding area	low	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	high
39. Adjacent property	high	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Reef 02914		
1. Natural environment		
Ecological systems		
1. Native animals	low	moderate
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	high	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	low	moderate
8. Visible foreground	moderate	
9. Improvements	high	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	moderate	moderate
11. Recreation use by other parties	high	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	moderate	moderate
15. Terrain	moderate	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	moderate	moderate
18. Trailhead facilities	high	
Reef 02914		
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	low	low
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	low	low
24. Area access	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Snowmobiling opportunities		
25. Terrain	high	high
26. Use restrictions	high	
4. Special features and values		
Scenic features		
27. Terrain features	moderate	moderate
28. Water features	moderate	
Other special features		
29. Other special features	moderate	moderate
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	moderate	
5. Manageability		
Manageable		
33. Size and shape	moderate	moderate
34. Surrounding area	moderate	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	moderate
39. Adjacent property	moderate	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	
High Lakes NF915		
1. Natural environment		
Ecological systems		
1. Native animals	low	high
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	high	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	high	high
8. Visible foreground	high	
9. Improvements	moderate	
High Lakes NF915		
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	moderate	moderate
11. Recreation use by other parties	low	
Provides challenge and adventure		
12. Terrain	moderate	moderate
13. Ability, knowledge, skill	moderate	
Hiking/Backpacking opportunities		
14. Trails	high	high
15. Terrain	moderate	
16. Dispersed camping	high	
Saddle stock opportunities		
17. Trails	high	high
18. Trailhead facilities	moderate	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	moderate	moderate
24. Area access	moderate	
Snowmobiling opportunities		
25. Terrain	moderate	moderate
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	high	high
28. Water features	high	
Other special features		
29. Other special features	high	moderate
30. Designated special area(s)	low	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Scientific, educational, or historical values		
31. Value presence	moderate	moderate
32. Value uniqueness	moderate	
5. Manageability		
Manageable		
33. Size and shape	high	high
34. Surrounding area	high	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	
Area boundaries are manageable		
38. Area access	moderate	high
39. Adjacent property	high	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	low	low
42. Human improvement	moderate	
High Lakes Addition NF915a		
1. Natural environment		
Ecological systems		
1. Native animals	low	moderate
2. Threatened and endangered species	high	
3. Yellowstone cutthroat trout distribution	low	
4. Habitat linkage	high	
5. Noxious weeds	high	
6. Water quality	moderate	
2. Undeveloped		
Natural and free from disturbance		
7. Free of disturbance	moderate	moderate
8. Visible foreground	moderate	
9. Improvements	moderate	
3. Outstanding opportunities for solitude or primitive and unconfined recreation		
Opportunity for solitude		
10. Feeling alone	low	low
11. Recreation use by other parties	low	
Provides challenge and adventure		
12. Terrain	low	low
13. Ability, knowledge, skill	low	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Hiking/Backpacking opportunities		
14. Trails	low	moderate
15. Terrain	high	
16. Dispersed camping	moderate	
Saddle stock opportunities		
17. Trails	low	low
18. Trailhead facilities	moderate	
Hunting opportunities		
19. Big game populations	high	high
20. Terrain	high	
Fishing opportunities		
21. Game fish populations	high	high
22. Stream variables	moderate	
Skiing and snowshoeing opportunities		
23. Terrain	high	high
24. Area access	moderate	
Snowmobiling opportunities		
25. Terrain	low	low
26. Use restrictions	low	
4. Special features and values		
Scenic features		
27. Terrain features	low	low
28. Water features	moderate	
Other special features		
29. Other special features	low	low
30. Designated special area(s)	low	
Scientific, educational, or historical values		
31. Value presence	low	low
32. Value uniqueness	low	
High Lakes Addition NF915a		
5. Manageability		
Manageable		
33. Size and shape	low	moderate
34. Surrounding area	low	
35. Location	high	
Area boundaries are recognizable		
36. Identifiable on the ground	moderate	moderate
37. Boundary adjustment	moderate	

Table 2. Details of the capability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Area boundaries are manageable		
38. Area access	low	moderate
39. Adjacent property	high	
40. Inholdings	high	
Area boundaries constitute barrier to prohibited use		
41. Topographic feature	moderate	moderate
42. Human improvement	moderate	

Availability

The availability determination for wilderness recommendation is conditioned on the value of and need for the wilderness resource compared to the value of and need for the area for other resources.

The availability of an area for wilderness management must be evaluated against other resource needs, demands, and uses of the area. To be available for wilderness, the wilderness value—both tangible and intangible—should offset the value of the other resources. The predominant value does not necessarily reflect the use or combination of uses that would yield the greatest dollar return or the greatest unit output. In evaluating other resources, current uses, trends, and potential future uses and outputs need to be considered.

Wilderness designation and management of an area can have an effect on the management of adjacent lands. Evaluation of other resource needs may need to be considered in the area adjacent to an area. Forest Service Handbook 1909.12, chapter 72.21 provides some examples and guidance in evaluating the development and management for sustained yield production of resources other than the wilderness resource.

The availability process

While the capability process evaluated the wilderness characteristics of an area, the availability process considered other resource needs.

Shoshone National Forest resource specialists in fisheries, silviculture, fuels, plants, soils, wildlife, and hydrology rated the resources for each area. Table 3 shows the availability criteria and ratings. Details of the availability assessment are shown in table 4.

Table 3. Area availability resource criteria

Resources
1. Areas that are of high value for water yield or on-site storage where installation and maintenance of improvements may be required
2. Areas needing management for wildlife or aquatic animals that might conflict with wilderness management
3. Areas needing active aquatic restoration activities
4. Areas needing active vegetative restoration activity due to specific species survival, or identifiable fuels reduction activity to reduce the risk of wildfire, or known areas of severe insect infestation(s) that will lead to high tree mortality
5. Areas of high value mineral deposits of economic or strategic importance
6. Areas having such unique characteristics or natural phenomena that public access should be developed to facilitate public use and enjoyment including winter sports sites
7. Lands committed through contracts, permits, or agreements that would be in conflict with wilderness management (some minor permitted uses may still be allowed)
Ratings
High = areas having evidence of and high priority need for treatment in the category addressed.
Moderate = areas having a need for treatment in the category addressed.
Low = areas having no to little need of treatment or management addressed.

Table 4. Details of the availability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Criteria	Windy Mountain 02039	Pat O'Hara 02040	Sulphur Creek 02041	Clarks Fork 02042	Sunlight 02043	Trout Creek 02044	Wapiti Valley North 02045
1. Areas that are of high value for water yield or on-site storage where installation and maintenance of improvements may be required.	low	low	low	low	low	low	low
2. Areas needing management for wildlife or aquatic animals that might conflict with wilderness management.	low	low	low	low	low	low	low
3. Areas needing active aquatic restoration activities.	low	low	low	low	low	low	low
4. Areas needing active vegetative restoration activity due to specific species survival, or identifiable fuels reduction activity to reduce the risk of wildfire, or known areas of severe insect infestation(s) that will lead to high tree mortality.	mod	high	high	high	mod	high	mod

Table 4. Details of the availability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Criteria	Windy Mountain 02039	Pat O'Hara 02040	Sulphur Creek 02041	Clarks Fork 02042	Sunlight 02043	Trout Creek 02044	Wapiti Valley North 02045
5. Oil and gas potential	low	low	low	low	low	mod	mod/low
6. Areas having such unique characteristics or natural phenomena that public access should be developed to facilitate public use and enjoyment including winter sports sites.	low	low	low	low	low	low	low
7. Lands committed through contracts, permits, or agreements that would be in conflict with wilderness management (some minor permitted uses may still be allowed).	low	low	mod	mod	mod	low	high
Number of high ratings	0	1	1	1	0	1	1
Number of moderate ratings	1	0	1	1	2	1	2
Number of low ratings	6	6	5	5	5	5	4
Availability rating[1]	high	high	high	high	high	high	moderate

[1] The availability rating for an area for proposed wilderness designation will be the opposite of the rating for other resource requirements. For example, a rating of high means a low rating for wilderness designation.

Table 4. Details of the availability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Criteria	Rattlesnake 02046	Wapiti Valley South 02048	South Fork 02049	Carter Mountain 02050	Franc's Peak 02051	Wood River 02052	Castle Rock 02053
1. Areas that are of high value for water yield or on-site storage where installation and maintenance of improvements may be required.	low	low	low	low	low	mod	mod
2. Areas needing management for wildlife or aquatic animals that might conflict with wilderness management.	low	low	low	low	low	low	low
3. Areas needing active aquatic restoration activities.	low	low	low	low	low	low	low
4. Areas needing active vegetative restoration activity due to specific species survival, or identifiable fuels reduction activity to reduce the risk of wildfire, or known areas of severe insect infestation(s) that will lead to high tree mortality.	high	high	high	mod	high	high	low
5. Oil and gas potential	mod	mod/low	high/mod	high	high	high	high

Table 4. Details of the availability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Criteria	Rattlesnake 02046	Wapiti Valley South 02048	South Fork 02049	Carter Mountain 02050	Franc's Peak 02051	Wood River 02052	Castle Rock 02053
6. Areas having such unique characteristics or natural phenomena that public access should be developed to facilitate public use and enjoyment including winter sports sites.	low	low	low	low	low	low	low
7. Lands committed through contracts, permits, or agreements that would be in conflict with wilderness management (some minor permitted uses may still be allowed).	low	low/high	low/high	low	low	low	low
Number of high ratings	1	2	1	1	2	2	1
Number of moderate ratings	1	1	1	1	0	1	1
Number of low ratings	5	4	5	5	5	4	5
Availability rating[2]	high	moderate	low	high	moderate	moderate	high

[2] The availability rating for an area for proposed wilderness designation will be the opposite of the rating for other resource requirements. For example, a rating of high means a low rating for wilderness designation.

Table 4. Details of the availability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Criteria	Telephone Draw 02054	Carson Lake 02055	East Dunoir 02056	South Dunoir 02057	Dunoir 02058	West Dunoir 02059	Sheridan Pass 02060
1. Areas that are of high value for water yield or on-site storage where installation and maintenance of improvements may be required.	mod	low	low	low	low	low	low
2. Areas needing management for wildlife or aquatic animals that might conflict with wilderness management.	mod	low	low	low	low	low	low
3. Areas needing active aquatic restoration activities.	low	low	low	low	low	low	low
4. Areas needing active vegetative restoration activity due to specific species survival, or identifiable fuels reduction activity to reduce the risk of wildfire, or known areas of severe insect infestation(s) that will lead to high tree mortality.	mod	mod	high	mod	mod	high	high
5. Oil and gas potential	high	high	high	low	high	high	high

Table 4. Details of the availability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Criteria	Telephone Draw 02054	Carson Lake 02055	East Dunoir 02056	South Dunoir 02057	Dunoir 02058	West Dunoir 02059	Sheridan Pass 02060
6. Areas having such unique characteristics or natural phenomena that public access should be developed to facilitate public use and enjoyment including winter sports sites.	low	low	low	low	low	low	low
7. Lands committed through contracts, permits, or agreements that would be in conflict with wilderness management (some minor permitted uses may still be allowed).	low	low	low	low	low	low	mod
Number of high ratings	1	1	2	0	1	2	2
Number of moderate ratings	3	1	0	1	1	0	1
Number of low ratings	3	5	5	5	5	5	4
Availability rating[3]	moderate	high	moderate	high	high	moderate	moderate

[3] The availability rating for an area for proposed wilderness designation will be the opposite of the rating for other resource requirements. For example, a rating of high means a low rating for wilderness designation.

Table 4. Details of the availability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Criteria	Benchmark 02061	Salt Creek 02062	Little Popo Agie 02064	Canyon Creek 02065	Pass Creek 02066	Middle Fork 02901	Warm Spring Creek 02902
1. Areas that are of high value for water yield or on-site storage where installation and maintenance of improvements may be required.	low	low	mod	mod	mod	mod	low
2. Areas needing management for wildlife or aquatic animals that might conflict with wilderness management.	mod	low	low	low	low	low	low
3. Areas needing active aquatic restoration activities.	low	low	low	low	low	low	low
4. Areas needing active vegetative restoration activity due to specific species survival, or identifiable fuels reduction activity to reduce the risk of wildfire, or known areas of severe insect infestation(s) that will lead to high tree mortality.	mod	mod	mod	mod	low	mod	low
5. Oil and gas potential	high	high	low	low (no potential)	low (no potential)	low (no potential)	high

Table 4. Details of the availability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Criteria	Benchmark 02061	Salt Creek 02062	Little Popo Agie 02064	Canyon Creek 02065	Pass Creek 02066	Middle Fork 02901	Warm Spring Creek 02902
6. Areas having such unique characteristics or natural phenomena that public access should be developed to facilitate public use and enjoyment including winter sports sites.	low	low	low	low	low	low	low
7. Lands committed through contracts, permits, or agreements that would be in conflict with wilderness management (some minor permitted uses may still be allowed).	mod	mod	low	mod	low	mod	mod
Number of high ratings	1	1	0	0	0	0	1
Number of moderate ratings	3	2	2	3	1	3	1
Number of low ratings	3	4	5	4	6	4	5
Availability rating[4]	moderate	moderate	high	moderate	high	moderate	high

[4] The availability rating for an area for proposed wilderness designation will be the opposite of the rating for other resource requirements. For example, a rating of high means a low rating for wilderness designation.

Table 4. Details of the availability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Criteria	Togwotee Pass 02903	Deep Lake 02911	North Boundary 02913	Reef 02914	High Lakes NF915	High Lakes addition NF915a
1. Areas that are of high value for water yield or on-site storage where installation and maintenance of improvements may be required.	mod	low	low	low	low	low
2. Areas needing management for wildlife or aquatic animals that might conflict with wilderness management.	low	low	low	low	low	low
3. Areas needing active aquatic restoration activities.	low	low	low	low	low	low
4. Areas needing active vegetative restoration activity due to specific species survival, or identifiable fuels reduction activity to reduce the risk of wildfire, or known areas of severe insect infestation(s) that will lead to high tree mortality.	mod	low	mod	low	low	low
5. Oil and gas potential	high	low (no potential)	low (withdrawn)	low (no potential)	low (withdrawn)	low (withdrawn)

Table 4. Details of the availability assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Criteria	Togwotee Pass 02903	Deep Lake 02911	North Boundary 02913	Reef 02914	High Lakes NF915	High Lakes addition NF915a
6. Areas having such unique characteristics or natural phenomena that public access should be developed to facilitate public use and enjoyment including winter sports sites.	low	low	low	low	low	low
7. Lands committed through contracts, permits, or agreements that would be in conflict with wilderness management (some minor permitted uses may still be allowed).	low	low	low	low	low	low
Number of high ratings	1	0	0	0	0	0
Number of moderate ratings	2	0	1	0	0	0
Number of low ratings	4	7	6	7	7	7
Availability rating[5]	moderate	high	high	high	high	high

[5] The availability rating for an area for potential wilderness designation will be the opposite of the rating for other resource requirements. For example, a rating of high means a low rating for wilderness designation.

Need[6]

After evaluating an area's capability for providing wilderness characteristics and availability for wilderness designation, the last step of the evaluation process is to determine if the area is needed as part of the National Wilderness Preservation System.

Forest Service Handbook (FSH 1909.12 72.3) directs that the need for an area to be designated as wilderness is determined through an analysis of the degree to which it contributes to the overall National Wilderness Preservation System. It goes on to say, "Demonstrate this need through the public involvement process, including public input to the evaluation report. Deal with the 'need' on a regional basis and evaluate such factors as the geographic distribution of areas and representations of landforms and ecosystems."

This section provides an assessment of factors that can be used to assess the "need" for additional wilderness designation. A summary of the assessment of those factors is included next. Further details discussion on the factors follows the summary.

Summary of Need analysis

The following factors are addressed in the need assessment below:

1. Public input
2. Regional distribution of wilderness and visitor pressure on existing wilderness
3. Availability of other lands for unconfined recreation
4. Providing refuge for wildlife species and providing representation of landforms

Factors of regional distribution, visitor pressure, and other lands providing unconfined recreation all show a low need for additional wilderness. Based upon public input, there is no consensus, but there is a segment of the public that feels additional wilderness is needed. The assessment of the 4th factor identifies 14 areas that indicate a high need for wilderness areas that have habitat for key wildlife species and provide representative landforms. To some degree, this need is already met by existing designated wilderness. How much more representation of these items is needed is a subjective call and the rating analysis does not try to make that call. No overall assessment for need was made by trying to aggregate these factors together into one rating. Such a rating would be totally dependent upon how the factors were combined and weighted. The individual elements will be used by the decision maker in coming to a final decision.

Assessment of individual Need factors

Public input on the need for additional wilderness

Management of 2001 Roadless Area Conservation Rule lands and other undeveloped lands are one of the highest areas of public concern in the revision process.

[6] The portion of the need assessment displayed in Table 7 was updated between draft and final. One typo was found that changed Wood River from a moderate need to a high need. The analysis for question 4 on ecoregions was verified and a number of errors were fixed. The fixes affected the overall rating for two areas. Carter Mountain went from a moderate to a low need and south Dunoir went from a high to a moderate need.

A random public survey commissioned by the State of Wyoming queried residents from the four-county area around the Shoshone on their desire for additional wilderness designation on the Forest. Respondents to the survey were asked what percentage of existing roadless areas they would like to see recommended to Congress for additional wilderness. Table 5 displays the survey results.[7]

Table 5. Percentage of survey respondents wanting additional wilderness on the Shoshone National Forest

Number of areas recommended for wilderness	Percent of respondents
None of the roadless areas	40
Some of the roadless areas	24
All of the roadless areas	21
Don't know	15

The mix of opinions reflects the range of comments received throughout the revision process and on the DEIS and this evaluation. A segment of the public, including the majority of the local government cooperators, generally does not support additional wilderness designation because it limits the types of recreational uses and resource management options that can occur in the areas; they believe there are enough designated wilderness areas on the Shoshone. Another segment of the public generally supports additional wilderness designation because it is the best way to ensure long-term protection of the areas. Between these positions are persons who would like to see a select number of areas managed as wilderness. From public meetings, emails, and letters, there is no clear consensus from the public on whether additional designated wilderness is needed on the Forest.

Regional distribution of wilderness

One need factor that is not addressed by individual area is the regional distribution and availability of wilderness. There are 1,364,000 acres of designated wilderness on the Shoshone, representing 55 percent of the total Forest acres.

The Shoshone is one of six national forests and two national parks that comprise the Greater Yellowstone Area.[8] The total acreage on the six national forests is 12,000,000 acres, with 4,000,000 acres of designated wilderness. National park lands total 2,000,000 acres. On the east side of Yellowstone National Park, the Bridger-Teton and Shoshone National Forests and the Beartooth Ranger District of the Custer National Forest consist of nearly 50 percent designated wilderness. The Shoshone and its wilderness areas contribute to one of the largest expanses of contiguous wilderness in the lower 48 states.

A connected evaluation factor is whether present visitor pressure and the associated trend of that pressure is at a level that is affecting or will affect currently designated wilderness. Given the amount of wilderness in the geographic area and the generally low population the impact of visitor pressure on existing wilderness is not currently an issue, nor is it anticipated that it will become an issue.

Based on the factors of regional distribution and availability of wilderness and the impact of visitor pressure, the need for additional wilderness on the Shoshone is low.

[7] The survey results were published in Report: Study of Preferences and Values on the Shoshone National Forest and are available from the Shoshone National Forest Supervisor's Office in Cody and on the Forest's Web site.
[8] The six national forests in the Greater Yellowstone Area are the Beaverhead-Deerlodge, Bridger-Teton, Caribou-Targhee, Custer, Gallatin, and Shoshone. The two national parks are Yellowstone and Grand Teton.

Other lands that provide unconfined recreation

One consideration on the need for additional wilderness is whether there are other non-wilderness lands on the Shoshone that are available to provide opportunities for unconfined outdoor recreation experiences. There are over 745,000 acres of forest being considered in this wilderness evaluation. The vast majority of that land is also classified as inventoried roadless areas. That portion is covered by the 2001 Roadless Conservation Rule has strict limits on the type of management activities that can be conducted. In the alternatives being considered in the plan revision, the most development-oriented alternative manages one-third of the wilderness evaluation areas under back country non-motorized management prescriptions. This prescription provides most of the same opportunities for unconfined recreation that designated wilderness does. The proposed action manages half of the wilderness evaluation area under this prescription. Based upon the factor of whether there are non-wilderness lands available to provide opportunities for unconfined outdoor recreation experiences, the need for additional wilderness on the Shoshone is low.

Need of refuge for wildlife species and inclusion of ecoregions in designated wilderness

To assess the factors related to providing refuge for wildlife species and inclusion of landforms, the interdisciplinary team rated five criteria and created a composite score for need. Additional discussion on the scoring is included below. For these factors, 14 areas were identified as having a high need. It is important to realize that for the wildlife portion of the composite score that existing designated wilderness already provides lands that meet some of that need. The landform portion of the composite score does indicate that some of the areas include ecosystem subsections that are not in currently designated wilderness. Five areas rate high for that criterion. For most of those areas, the actual acreage of the unrepresented landform is less than 3,000 acres. If those areas are recommended, care should be taken to review landform information in identifying a final boundary.

Shoshone National Forest resource specialists in fisheries, plants, wildlife, and soils rated each area by answering questions, shown in table 6.[9] An overall rating was applied for each area, based on the following criteria:

- High overall rating if three or more questions were rated high, or two questions were rated high and at least two of the remaining three questions were rated moderate
- Moderate overall rating if two questions were rated high and not more than one of the remaining three questions was rated moderate, or one question was rated high and at least one of the remaining four was rated moderate, or no question was rated high but two or more were rated moderate
- Low overall rating if four of the questions rated low or no question was rated high and no more than two were rated moderate

Details of the need assessment are shown in table 7.

[9] One criterion for assessing need that is commonly used in analyses is the number of wilderness acres near population centers. This criterion was not used for the Shoshone's analysis because large acres of wilderness are distributed across the Forest; these acres provide wilderness opportunities to population centers.

Table 6. Need criteria

Questions	High	Moderate	Low
1. Are Yellowstone cutthroat trout present?	High genetic purity Yellowstone cutthroat present	Yellowstone cutthroat trout present	Yellowstone cutthroat trout not present
2. Are species of concern or species of interest present?	Species of concern present	Species of interest present	Neither species of concern nor interest present
3. Is the area adjacent to existing wilderness?	Adjacent to existing wilderness boundary	Separated from wilderness boundary by a corridor	Not applicable
4. Are ecoregion[10] subsections represented in wilderness?	Ecoregion subsections represented by not more than 10,000 acres	Ecoregion subsections represented by 10,001 to 100,000 acres	Ecoregion subsections represented by more than 100,000 acres
5. Does the grizzly bear primary conservation area or a lynx analysis unit occur in the area?	Area contains at least 100 acres of grizzly bear primary conservation area and lynx analysis unit	Area contains at least 100 acres of grizzly bear primary conservation area or lynx analysis unit	Less than 100 acres or no grizzly bear primary conservation area or lynx analysis unit

[10] An ecoregion is a classification and mapping system for stratifying the earth into progressively smaller areas of increasingly uniform ecological potentials. Ecological types are classified and ecological units are mapped based on associations of those factors that directly affect or indirectly express energy, moisture, and nutrient gradients, which regulate the structure and function of ecosystems. These factors include climate, physiography, water, soils, air, hydrology, and potential natural communities.

Table 7. Details of the need assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Criteria	Windy Mountain 02039	Pat O'Hara 02040	Sulphur Creek 02041	Clarks Fork 02042	Sunlight 02043	Trout Creek 02044	Wapiti Valley North 02045
1. Are Yellowstone cutthroat trout present?	low	low	low	low	low	low	mod
2. Are species of concern or species of interest present?	high	high	high	mod	high	high	high
3. Is the area adjacent to existing wilderness?	high	high	high	low	high	high	high
4. Are ecoregion subsections represented in wilderness?	mod	mod	mod	mod	low	high	low
5. Does the grizzly bear primary conservation area or a lynx analysis unit occur in the area?	high	low	high	high	high	mod	high
Need rating	high	moderate	high	moderate	high	high	high
Criteria	**Rattlesnake 02046**	**Wapiti Valley South 02048**	**South Fork 02049**	**Carter Mountain 02050**	**Franc's Peak 02051**	**Wood River 02052**	**Castle Rock 02053**
1. Are Yellowstone cutthroat trout present?	low	mod	high	low	high	high	high
2. Are species of concern or species of interest present?	high	high	high	low	high	high	mod
3. Is the area adjacent to existing wilderness?	high	high	high	low	high	high	high
4. Are ecoregion subsections represented in wilderness?	mod	high	high	low	low	low	low
5. Does the grizzly bear primary conservation area or a lynx analysis unit occur in the area?	low	high	high	mod	mod	mod	mod
Need rating	moderate	high	high	moderate	high	high	moderate

Table 7. Details of the need assessment for areas being evaluated for potential wilderness on the Shoshone National Forest

Criteria	Telephone Draw 02054	Carson Lake 02055	East Dunoir 02056	South Dunoir 02057	Dunoir 02058	West Dunoir 02059	Sheridan Pass 02060
1. Are Yellowstone cutthroat trout present?	high	low	low	low	low	low	low
2. Are species of concern or species of interest present?	mod	high	mod	high	high	mod	mod
3. Is the area adjacent to existing wilderness?	high	high	high	low	high	low	low
4. Are ecoregion subsections represented in wilderness?	low	low	Low	low	low	low	low
5. Does the grizzly bear primary conservation area or a lynx analysis unit occur in the area?	mod	mod	high	high	high	high	mod
Need rating	high	moderate	moderate	high	high	moderate	moderate
Criteria	**Benchmark 02061**	**Salt Creek 02062**	**Little Popo Agie 02064**	**Canyon Creek 02065**	**Pass Creek 02066**	**Middle Fork 02901**	**Warm Spring Creek 02902**
1. Are Yellowstone cutthroat trout present?	low	low	low	low	low	low	low
2. Are species of concern or species of interest present?	mod	mod	high	mod	mod	mod	mod
3. Is the area adjacent to existing wilderness?	high	low	low	low	low	high	high
4. Are ecoregion subsections represented in wilderness?	mod	high	mod	mod	mod	mod	high
5. Does the grizzly bear primary conservation area or a lynx analysis unit occur in the area?	mod	mod	low	low	low	low	mod
Need rating	moderate	moderate	moderate	low	moderate	moderate	high

Attachment A – Summary of assessments

Area name	Capability	Availability	Need
Windy Mountain 02039	3 high 12 moderate 2 low	0 high 1 moderate 6 low	3 high 1 moderate 1 low
	capability rating moderate	availability rating high	need rating high
Pat O'Hara 02040	4 high 12 moderate 1 low	1 high 0 moderate 6 low	2 high 0 moderate 2 low
	capability rating moderate	availability rating high	need rating moderate
Sulphur Creek 02041	6 high 10 moderate 1 low	1 high 1 moderate 5 low	3 high 1 moderate 1 low
	capability rating moderate	availability rating high	need rating high
Clarks Fork 02042	10 high 7 moderate 0 low	1 high 1 moderate 5 low	1 high 2 moderate 2 low
	capability rating high	availability rating high	need rating moderate
Sunlight 02043	3 high 11 moderate 3 low	0 high 2 moderate 5 low	3 high 0 moderate 2 low
	capability rating moderate	availability rating high	need rating high
Trout Creek 02044	12 high 5moderate 0 low	1 high 1 moderate 5 low	3 high 1 moderate 1 low
	capability rating high	availability rating high	need rating high
Wapiti Valley North 02045	9 high 7 moderate 1 low	1 high 2 moderate 4 low	3 high 1 moderate 1 low
	capability rating high	availability rating moderate	need rating high
Rattlesnake 02046	6 high 4 moderate 7 low	1 high 1 moderate 5 low	2 high 1 moderate 2 low
	capability rating low	availability rating high	need rating moderate
Wapiti Valley South 02048	12 high 5 moderate 0 low	2 high 1 moderate 4 low	4 high 1 moderate 0 low
	capability rating high	availability rating moderate	need rating high
South Fork 02049	5 high 12 moderate 0 low	3 high 0 moderate 4 low	5 High 0 moderate 0 low
	capability rating moderate	availability rating low	need rating high
Carter Mountain 02050	2 high 8 moderate 7 low	1 high 1 moderate 5 low	0 high 1 moderate 4 low
	capability rating moderate	availability rating moderate	need rating low

Attachment A – Summary of assessments

Area name	Capability	Availability	Need
Franc's Peak 02051	14 high 2 moderate 1 low	2 high 0 moderate 5 low	3 high 1 moderate 1 low
	capability rating high	availability rating moderate	need rating high
Wood River 02052	10 high 7 moderate 0 low	2 high 1 moderate 4 low	3 high 1 moderate 1 low
	capability rating high	availability rating moderate	need rating high
Castle Rock 02053	5 high 9 moderate 3 low	1 high 1 moderate 5 low	2 high 2 moderate 1 low
	capability rating moderate	availability rating high	need rating moderate
Telephone Draw 02054	6 high 11 moderate 0 low	1 high 3 moderate 3 low	2 high 2 moderate 1low
	capability rating moderate	availability rating moderate	need rating high
Carson Lake 02055	4 high 8 moderate 3 low	1 high 1 moderate 5 low	2 high 1 moderate 2low
	capability rating moderate	availability rating high	need rating moderate
East Dunoir 02056	4 high 11 moderate 2 low	2 high 0 moderate 5 low	2 high 1 moderate 2 low
	capability rating moderate	availability rating moderate	need rating moderate
South Dunoir 02057	4 high 9 moderate 4 low	0 high 1 moderate 6 low	2 high 0 moderate 3 low
	capability rating moderate	availability rating high	need rating moderate
Dunoir 02058	9 high 8 moderate 0 low	1 high 1 moderate 5 low	3 high 0 moderate 2 low
	capability rating high	availability rating high	need rating high
West Dunoir 02059	3 high 11 moderate 3 low	2 high 0 moderate 5 low	1 high 1 moderate 3 low
	capability rating moderate	availability rating moderate	need rating moderate
Sheridan Pass 02060	3 high 12 moderate 2 low	2 high 1 moderate 4 low	0 high 2 moderate 3 low
	capability rating moderate	availability rating moderate	need rating moderate
Benchmark 02061	3 high 11 moderate 3 low	1 high 3 moderate 3 low	1 high 3 moderate 1 low
	capability rating moderate	availability rating moderate	need rating moderate

Attachment A – Summary of assessments

Area name	Capability	Availability	Need
Salt Creek 02062	3 high 9 moderate 5 low	1 high 2 moderate 4 low	1 high 2 moderate 2 low
	capability rating moderate	availability rating moderate	need rating moderate
Little Popo Agie 02064	6 high 7 moderate 4 low	0 high 2 moderate 5 low	1 high 1 moderate 3 low
	capability rating moderate	availability rating high	need rating moderate
Canyon Creek 02065	6 high 8 moderate 3 low	0 high 3 moderate 4 low	0 high 2 moderate 3 low
	capability rating moderate	availability rating moderate	need rating low
Pass Creek 02066	4 high 8 moderate 5 low	0 high 1 moderate 6 low	0 high 2 moderate 3 low
	capability rating moderate	availability rating high	need rating moderate
Middle Fork 02901	6 high 11 moderate 0 low	0 high 3 moderate 4 low	1 high 2 moderate 2 low
	capability rating moderate	availability rating moderate	need rating moderate
Warm Spring Creek 02902	6 high 6 moderate 5 low	1 high 1 moderate 5 low	2 high 2 moderate 1 low
	capability rating moderate	availability rating high	need rating high
Togwotee Pass 02903	8 high 7 moderate 2 low	1 high 2 moderate 4 low	3 high 0 moderate 2 low
	capability rating high	availability rating moderate	need rating high
Deep Lake 02911	12 high 3 moderate 2 low	0 high 0 moderate 7 low	1 high 2 moderate 2 low
	capability rating high	availability rating high	need rating moderate
North Boundary 02913	3 high 6 moderate 8 low	0 high 1 moderate 6 low	2 high 1 moderate 2 low
	capability rating low	availability rating high	need rating moderate
Reef 02914	2 high 13 moderate 2 low	0 high 0 moderate 7 low	2 high 1 moderate 2 low
	capability rating moderate	availability rating high	need rating moderate
High Lakes NF915	9 high 7 moderate 1 low	0 high 0 moderate 7 low	3 high 1 moderate 1 low
	capability rating high	availability rating high	need rating high
High Lakes addition NF915a	3 high 7 moderate 7 low	0 high 0 moderate 7 low	2 high 1 moderate 2 low
	capability rating low	availability rating high	need rating moderate

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Attachment B – The 2006 inventory of areas for evaluation of wilderness potential

Mapping results

The 2006 inventory does not include 40,176 acres that are covered under the 2001 Roadless Conservation Area Rule (Rule).[11] These acres mostly occur in smaller blocks, some of which are the result of apparent errors in the original inventory, while others are the result of harvest and road construction that has occurred since 1979.

The 2006 inventory includes 104,962 acres not covered under the Rule. These additional acres include one new area (Salt Creek, 7,171 acres), with the remaining occurring in blocks adjacent to various 2001 Roadless area and wilderness areas. These new blocks are a result of various situations. In some cases, blocks of undeveloped areas were not included in the original mapping used for the Rule. The original inventory included many boundaries that were a 0.25 mile or more from roads. Criteria used in the 2006 inventory moved many of those boundaries closer to the roads. In one area, the conversion of private land to National Forest System lands (Kirwin) resulted in a significant block that was included in the 2006 inventory.

In summary, the 2006 inventory identified 751,336 acres for evaluation as potential wilderness. This includes 64,787 acres more than are covered by the Rule. This amounts to 31 percent of the Forest.

Inventory process

Step one—inventory criteria

In step 1 we identified areas on the Forest that met the minimum size requirements and did not contain forest roads[12] (Forest Service Handbook 1909.12,71.1). The minimum size requirements that applied to the Shoshone are 5,000 acres or less than 5,000 acres if they are contiguous to an existing wilderness area. As part of the process, we buffered all forest roads by 300 feet. This reflects the current direction that allows motorized travel within 300 feet of forest roads for parking or dispersed camping. This buffering did not result in the elimination of any areas, because of the size criteria. The 300-foot criterion was established by Region 2 to maintain consistency between forests in the region.

Step 1 resulted in the identification of 32 areas. This was later changed to 34 areas by splitting some of the original areas.

Step two—criteria for including improvements and boundary adjustments

The results of step 1 included some areas of land not properly classified as undeveloped. Some of these lands are configured in a manner that is not characteristic of undeveloped lands, e.g., a narrow section of land between two roads. Other lands have had activities or include infrastructure that eliminates them

[11] The 1979 RARE II inventory was the basis for the areas mapped for the 2001 Roadless Area Conservation Rule. The official designation of areas for the Rule is found in a set of inventoried roadless area maps, contained in Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000.
[12] Forest road – "A road wholly or partly within or adjacent to and serving the national Forest System that the Forest service determines is necessary for the protection, administration, and utilization of National Forest system and the use and development of its resources" (36 CFR 212.1). The Forest Service commonly refers to these as system roads. They are the ones that we identify on our roads atlas and associated database.

from consideration as potential wilderness. Criteria for determining what types of existing development are allowable in areas are identified in the directive system (Forest Service Handbook 1909.12,71.11, included below).

In step 2, area boundaries were adjusted to exclude areas of development and to address irregular configurations. The criteria related to area configuration and allowable development requires some amount of interpretation that is subjective. In order to achieve a level of consistency and to document the process, we developed a set of rules (table 8) to apply when making boundary adjustments.

Table 8. Rules for applying criteria

Situation	General rule
Boundary adjustments for improvements	
Road network penetrates the area resulting in fingers of undeveloped land with roads along each side	Based on road density within a watershed (6th level HUB) -If the road density is greater than 1 mile/sq mile, adjust the boundary to identify a portion that is undeveloped. -If the road density is less than 0.5 mile/sq mile, draw the boundary to cherry stem out the road. -If the road density is between 0.5 and 1.0 mile/sq mile, use best judgment to draw boundary.
Utility lines	Draw boundary off the line. Also exclude motorized routes that are required to maintain the utility line.
Areas of development, such as cabins and resorts	Draw boundary back 300 feet from structures. Use existing 2001 Roadless Area Conservation Rule lines when appropriate.
Evidence of timber harvest	Boundaries were adjusted to exclude past areas of harvest and associated temporary roads and skid trails. Where electronic records existed, those records were used to adjust the boundary. For small isolated areas of harvest that did not have associated skids trails and temporary roads the acres were not excluded. These small areas were generally light treatments that occurred more than 20 years ago. In some areas, district staff identified areas of past treatment that were not included in the electronic records. In that situation, aerial imagery was reviewed and areas with visual evidence of past harvest were delineated from the imagery to adjust the boundaries.
Boundary adjustments for irregular area configuration	
Configuration of area results in a neck or peninsula	Truncate the neck if it is less than 1 mile wide.
Boundary contains a large number of undulations in a short distance or has multiple sharp angles	Smooth boundaries to follow the general lay of the land. Features such as ridge tops, streams, and other topographic features provide good guides. Consider using boundaries that were used for the 2001 Roadless Conservation Area Rule.
Geographic features coincident with the 2001 Roadless Conservation Area Rule boundaries are within the vicinity of the boundary	Adjust boundary to the geographic feature. Examples would be the reef south of Chief Joseph Highway and the base of the Palisades northeast of Rattlesnake Creek.

From Forest Service Handbook 1909.12

71.11 Criteria for including improvements

Potential wilderness areas may qualify for the inventory even though they include the following types of areas or features:

1. Airstrips and heliports.
2. Cultural treatments involving plantations or plantings where the use of mechanical equipment is not evident.
3. Electronic installations, such as cell towers, television, radio, and telephone repeaters, and the like, provided their impact is minimal.
4. Areas with evidence of historic mining (50+ years ago). Do not include areas of significant current mineral activity, including prospecting with mechanical or motorized earthmoving equipment. The inventory may include areas where the only evidence of prospecting is holes that have been drilled without access roads to the site. Inventoried lands that may have potential for wilderness recommendation also may include:
    a. Areas that otherwise meet inventory criteria if they are covered by mineral leases having a "no surface occupancy" stipulation.
    b. Areas covered by mineral leases that otherwise meet inventory criteria only if the lessee has not exercised development and occupancy rights. If and when these rights are exercised, remove the area, or portion affected, from the inventory unless it is possible to establish specific occupancy provisions that would maintain the area in a condition suitable for wilderness.
5. National Grasslands and Prairies. National Grasslands and Prairies may have structures or evidence of vegetative manipulation resulting from past management practices. National Grassland and Prairie lands that contain the following features may be inventoried:
    a. Vegetation type conversions that are reverting to native vegetation with minimal evidence of cultivation.
    b. Less than 1 mile of interior fence per section.
7. Areas of less than 70-percent Federal ownership, if it is realistic to manage the Federal lands as wilderness, independent of the private land.
8. Minor structural range improvements (FSM 2240.5) such as fences or water troughs. Exclude areas where nonstructural range improvements are readily visible and apparent. Areas with spray or burning projects are permissible if there is little or no evidence of the project.
9. Recreation improvements such as occupancy spots or minor hunting or outfitter camps. As a general rule, do not include developed sites. Areas with minor, easily removable recreation developments may be included.
10. Timber harvest areas where logging and prior road construction are not evident, except as provided in section 71.12 for areas east of the 100th meridian. Examples include those areas containing early logging activities related to historic settlement of the vicinity, areas where stumps and skid trails or roads are substantially unrecognizable, or areas where clearcuts have regenerated to the degree that canopy closure is similar to surrounding uncut areas.
11. Ground-return telephone lines, electric lines, etc., if a right-of-way has not been cleared.

12. Watershed treatment areas if the use of mechanical equipment is not evident. The inventory may include areas where minor watershed treatment has been accomplished manually, such as small hand-constructed gully plugs.

Attachment C – Description of areas identified for potential wilderness evaluation

Introduction

These descriptions of the Shoshone National Forest's 2006 inventoried areas, and other information about these areas, were used to evaluate the areas for wilderness potential and will be used for assigning desired conditions to areas not recommended for wilderness.

About the descriptions

Vegetation percentages are shown for the most abundant vegetation types (those 10 percent or more in an area).

Windy Mountain (02039)

Acres	35,789
Ranger district	Clarks Fork
History	Originally 02039 Windy Mountain, 1979 RARE II inventory 31,161 acres
Location and access	Located in the northern portion of the Shoshone National Forest just north of the Sunlight drainage. Primary access is via State Highway 296 (Chief Joseph Highway) and forest road 101 (Sunlight Road). Trail access is via trails 603 and 604.
Boundaries	The North Absaroka Wilderness forms the western boundary, the Sunlight drainage forms most of the southern boundary, and the eastern and northern boundaries are formed by the Chief Joseph Highway and a few parcels of private land.
Physical and biological description	Terrain and topography consist of timbered slopes interspersed with openings and some flatter terrain along drainage bottoms. Windy Mountain (elevation 10,200 feet) is located in the middle of the area. Elevation ranges from 6,700 to 10,200 feet.
Features	Windy and White Mountains are the dominant visual features in this area. Tree-covered, mountainous terrain interspersed with openings characterizes the landscape. Large stands of burned timber remain from the 1988 Clover Mist Fire.
Vegetation	Grasslands 45%, Douglas-fir 36%, lodgepole pine 8%
Recreation	Recreation use is moderate and includes hiking, camping, horseback riding, and hunting. Trail 604 (Windy Mountain Trail) allows hikers and horseback riders to ascend the mountain and obtain a beautiful view of the Absaroka and Beartooth ranges. All trails in this area are popular with hunters, both on foot and on horseback. The recreation opportunity spectrum for the area is semi-primitive non-motorized.
Wildlife	The entire Windy Mountain area is within the grizzly bear primary conservation area. About 17,521 acres are considered bighorn sheep winter range and 22,170 acres are elk winter range. The Sunlight wolf pack spends part of the winter in this area. Windy Mountain is within lynx analysis units 3 and 4.
Range	Portions of two active allotments and associated developments (fences, spring developments) are within this area.
Water	This area has a few small streams.
Minerals	75% are available for oil and gas leasing with no surface occupancy, 25% are available with other stipulations
Heritage resources	There are four heritage sites in this area.
Special areas	None

Pat O'Hara (02040)

Acres	11,786
Ranger district	Clarks Fork and Wapiti
History	Originally part of 02040 Pat O'Hara, 1979 RARE II inventory 10,521 acres
Location and access	Located on the eastern boundary of the Shoshone National Forest. Primary access is via forest road 102 (Pat O'Hara Road) and forest road 401 (Monument Hill Road). There is no trail access.
Boundaries	The Forest boundary forms the eastern boundary of this area. The North Absaroka Wilderness runs along the western boundary and roaded areas border the area on the north and south.
Physical and biological description	Terrain and topography vary from lower sagebrush and grasslands to a high mountain ridge. The north side of the area consists of Douglas-fir stands at lower elevations with limber pine and spruce at higher elevations. The southern portion of the area contains spruce and fir at the upper and lower elevations with whitebark pine and limber pine at mid elevation. Elevation ranges from 6,000 to 9,000 feet
Features	The dominant feature is the long ridge of Pat O'Hara Mountain and Pat O'Hara Peak on the west boundary.
Vegetation	Spruce/fir 32%, grasslands 20%, Douglas-fir 18%, limber pine 10%
Recreation	Recreation use is low due to limited access to the area. The majority of use occurs during elk and deer hunting seasons. The recreation opportunity spectrum is semi-primitive non-motorized.
Wildlife	This area provides 4,326 acres of elk winter range. Most of lynx analysis unit 5 is within this area.
Range	Portions of two active allotments and associated developments (spring developments, fences) are in the area.
Water	Several creeks flow from the north side of Pat O'Hara Mountain. Pat O'Hara Creek flows east in the southern portion of the area.
Minerals	53% are available for oil and gas leasing with no surface occupancy, 45% are available with other stipulations
Heritage resources	None
Special areas	None

Sulphur Creek (02041)

Acres	27,730
Ranger district	Clarks Fork
History	Originally part of 02041 Sulphur Creek, 1979 RARE II inventory 25,184 acres
Location and access	Located just west of Dead Indian summit on the northern half of the Shoshone National Forest. Primary access is via State Highway 296 (Chief Joseph Highway) and forest road 101 (Sunlight Road). Trails 601 and 602 leading from the Elk Creek trailhead and Sunlight Ranger Station are primary access routes into this portion of the back country.
Boundaries	The Sunlight Creek drainage forms the northern boundary, the southern boundary follows the North Absaroka Wilderness, the Chief Joseph Highway runs along the east end of the area, and Company Creek forms the western boundary.
Physical and biological description	The area is predominantly forested slopes down to flatter creek bottoms. The forest is mainly lodgepole pine in the lower elevation creek bottoms, mixed stands of Douglas-fir, lodgepole pine, spruce/fir and limber pine at mid elevation, and Engelmann spruce at higher elevations. Elevation ranges from 6,000 to 9,900 feet.
Features	Tree-covered mountainous terrain interspersed with openings and creek drainages are the dominant landscape. Dead Indian, Trout, and Elkhorn Peaks are landmark peaks located outside the southern boundary of the area.
Vegetation	Douglas-fir 43%, grasslands 29%, lodgepole pine 15%
Recreation	Recreation use is light to moderate and includes hiking, horseback riding, and hunting. The recreation opportunity spectrum for this area is semi-primitive non-motorized.
Wildlife	The Sulphur Creek area provides winter habitat for bighorn sheep (4,471 acres) and elk (9,313 acres). This area includes 27,699 acres in the grizzly bear primary conservation area and is almost entirely within lynx analysis unit 4.
Range	Portions of one active allotment and associated developments (fences, spring developments) occur in this area.
Water	Several streams originate from the ridge at the area's southern boundary and flow into Sunlight Creek. There are a few small lakes.
Minerals	49% are available for oil and gas leasing with no surface occupancy, 51% are available with other stipulations
Heritage resources	There are eight heritage sites in the unit.
Special areas	None

Clarks Fork (02042)

Acres	36,451
Ranger district	Clarks Fork
History	Originally part of 02911 South Beartooth Highway, 1979 RARE II inventory 32,964 acres
Location and access	Located in the northeast portion of the Shoshone National Forest. Primary access is via U.S. Highway 212 (Beartooth Highway) and State Highway 296 (Chief Joseph Highway). Trail access to the southern portion of the area is via trail 628 (Clarks Fork Trail).
Boundaries	The Beartooth Highway forms the northern boundary, the Morrison Jeep Trail runs along the eastern boundary, and the Chief Joseph Highway runs along the southern and western boundaries.
Physical and biological description	Terrain and topography vary from alpine plateau and rock outcrops to the lower, heavily timbered areas of the Beartooth range. The area consists of open areas of alpine tundra on top of the Beartooth plateau interspersed with stands of conifers. The lower elevations are heavily timbered with Douglas-fir as the primary timber type. Elevation ranges from 6,500 to 9,900 feet.
Features	The dominant feature in this area is the steep face of the Beartooth Mountains on the southwestern edge of the area and the canyon of the Clarks Fork of the Yellowstone River, a designated wild river.
Vegetation	Douglas-fir 29%, grasslands 20%, lodgepole pine 16%, spruce/fir 13%
Recreation	Recreation use is fairly low and includes hiking and camping along trail 628 (Clarks Fork Trail). Most of the area is inaccessible except on foot, off the trail. The recreation opportunity spectrum for the majority of the area is semi-primitive non-motorized with a small portion semi-primitive motorized. There is some cross-country snowmobile use in the area.
Wildlife	This area provides wintering habitat for bighorn sheep (4,471 acres) and elk (9,313 acres). About 30,760 acres of this area are in the grizzly bear primary conservation area and part of this area is within lynx analysis unit 2.
Range	Portions of seven active allotments and associated developments (fences, spring developments) are in the area.
Water	There are several wet areas along the northern boundary of the area. Table and Canyon Creeks are the primary creeks; these creeks flow off the Beartooth range and into the Clarks Fork of the Yellowstone River. Numerous small creeks are found in the area.
Minerals	12% are legally withdrawn and 4% are administratively withdrawn from oil and gas leasing, 65% are available for oil and gas leasing with no surface occupancy, and 19% are available with other stipulations
Heritage resources	There are three heritage sites in this area.
Special areas	This area contains the Clarks Fork of the Yellowstone River (designated wild river), a portion of Sunlight Creek (eligible wild river), and the Bald Ridge potential Research Natural Area.

Sunlight (02043)

Acres	15,791
Ranger district	Clarks Fork
History	Originally part of 02041 Sulphur Creek, 02043 Headwaters Sunlight Creek, and 02042 Headwaters Sunlight Creek; 1979 RARE II inventory 7,612 acres
Location and access	Located at the headwaters of Sunlight Creek in the northern portion of the Shoshone National Forest. Primary access is via forest road 101 (Sunlight Road). Trail access is via trails 606 and 751.
Boundaries	The area is almost surrounded by the North Absaroka Wilderness. Company Creek and a private inholding form the unit's eastern boundary.
Physical and biological description	The majority of the terrain is steep mountain slopes climbing to a high ridge top. The area consists of mostly conifers, with whitebark pine at the higher elevations. Elevation ranges from 7,200 to 11,900 feet.
Features	The dominant features of the area are the high mountain peaks at the boundary.
Vegetation	Alpine 33%, barren 21%, Douglas-fir 13%, spruce/fir 15%
Recreation	Recreation use is low and includes hiking and horseback riding. Most use occurs on trail 751 that connects the Sunlight drainage to the North Fork drainage and trail 606 leading to Yellowstone National Park. The recreation opportunity spectrum is semi-primitive non-motorized.
Wildlife	All 15,791 acres of this area are in the grizzly bear primary conservation area.
Range	None
Water	The area contains one small stream and the upper reaches of Sunlight Creek.
Minerals	99% are available for oil and gas leasing with no surface occupancy, 1% is available with other stipulations
Heritage resources	There is one heritage site in the area.
Special areas	None

Trout Creek (02044)

Acres	39,274
Ranger district	Wapiti
History	Originally part of 02044 Trout Creek, 1979 RARE II inventory 37,546 acres
Location and access	Located on the eastern boundary of the Shoshone National Forest. Primary access is via Rattlesnake Canyon Road (private) and forest road 405 (Jim Mountain Road). Trail access is via trails 761.5 (Big Creek Trail), 762 (Jim Mountain Trail), 763, and 792.
Boundaries	The area is bound by the North Absaroka Wilderness to the north and west, the Forest boundary to the south, and the Rattlesnake drainage to the east.
Physical and biological description	Terrain consists mostly of low, open grass and sagebrush leading to timbered ridges. A large portion of the area consists of Douglas-fir stands with openings of grass and sagebrush at the lower elevations. At the higher elevations, conifers cover the timbered ridges. Elevation ranges from 6,600 to 12,200 feet.
Features	Dominant features are the high peaks of Jim Mountain and Crag and Trout Peaks along the boundary with the North Absaroka Wilderness.
Vegetation	Douglas-fir 31%, grasslands 25%, alpine 19%
Recreation	Recreation use is low due to limited access. The majority of use occurs during hunting seasons. The recreation opportunity spectrum is semi-primitive non-motorized.
Wildlife	This area provides 35,981 acres of bighorn sheep winter range and 28,215 acres of elk winter range. About 11,920 acres are in the grizzly bear primary conservation area.
Range	Portions of three active allotments and associated developments (spring developments, fences) occur in the area.
Water	Several creeks drain into Trout Creek. Big and Jim Creeks run through the area.
Minerals	85% are available for oil and gas leasing with no surface occupancy, 15% are available with other stipulations
Heritage resources	There are two heritage sites in the area.
Special areas	None

Wapiti Valley North (02045)

Acres	20,667
Ranger district	Wapiti
History	Originally part of 02045 Wapiti Valley North, 1979 RARE II inventory 18,589 acres
Location and access	Located on the north side of the North Fork of the Shoshone River between the drainage and the North Absaroka Wilderness. Primary access is via U.S. Highway 14, 16, 20 (North Fork Highway). Trails access is via trails 786 (Horse Creek Trail), 759 (Clearwater Trail), 764 (Gunbarrel Creek Trail), 790 (Goff Creek Trail), 791 (Libby Creek Trail), 754 (Mormon Creek Trail), 753 (Grinnell Creek Trail), and 751 (Pahsaka Trail).
Boundaries	Bound by the North Absaroka Wilderness to the north, the North Fork Highway to the south, and the Forest boundary to the east and west.
Physical and biological description	Terrain consists of low, open grass and sagebrush leading to timbered ridges on the eastern end. Timber increases to the west. A large portion of the area consists of openings of grass and sagebrush at the lower elevations and Douglas-fir and lodgepole pine in the western end and at higher elevations. Elevation ranges from 5,800 to 9,000 feet.
Features	Dominant features are the numerous rock formations along the southern edge of the area.
Vegetation	Douglas-fir 39%, grasslands 36%
Recreation	Recreation use is high due to good access via trails and the close proximity of campgrounds and resorts. The recreation opportunity spectrum is semi-primitive non-motorized.
Wildlife	This area provides 19,299 acres of bighorn sheep winter range and 17,188 acres of elk winter range. About 9,647 acres are in the grizzly bear primary conservation area. Portions of lynx analysis units 6 and 7 are within this area. Several wolf packs sporadically occupy the area.
Range	None
Water	Numerous creeks drain into the North Fork of the Shoshone River.
Minerals	48% are administratively withdrawn from oil and gas leasing, 29% are available for oil and gas leasing with no surface occupancy, and 23% are available with other stipulations
Heritage resources	There are four heritage sites in the area.
Special areas	The area contains a portion of the Grizzly Creek potential Research Natural Area.

Rattlesnake (02046)

Acres	4,702
Ranger district	Wapiti
History	Originally part of 02044 Trout Creek, 1979 RARE II inventory 4,294 acres
Location and access	Located on the eastern boundary of the Shoshone National Forest. Primary access is via the Rattlesnake Canyon Road (private). There is no trail access.
Boundaries	The area is bound by private land to the south and west, forest road 401.2 on the north, the North Absaroka Wilderness to the northeast, and the Forest boundary on the east.
Physical and biological description	Terrain consists mainly of low, open grass and sagebrush lands leading to a timbered ridge dominated by rock outcrops and cliffs known as the Palisades. Lower elevations consist of open grass and sagebrush, leading to stands of Douglas-fir and some limber pine. Elevation ranges from 6,800 to 8,000 feet.
Features	The dominant feature is the long ridge of Pat O'Hara Mountain and Pat O'Hara Peak at the west boundary.
Vegetation	Grasslands 48%, Douglas-fir 34%
Recreation	Recreation use is low due to the lack of public access to the area. The majority of use occurs during elk and deer hunting seasons. The recreation opportunity spectrum for the majority of the area is semi-primitive non-motorized with a small portion of semi-primitive motorized.
Wildlife	Approximately 4,025 acres are elk winter range. A small portion of lynx analysis unit 5 is within this area.
Range	Portions of one active allotment and associated developments (fences, spring developments) are in the area.
Water	There is one small, unnamed creek in the area.
Minerals	39% are available for oil and gas leasing with no surface occupancy, 61% are available with other stipulations
Heritage resources	None
Special areas	None

Wapiti Valley South (02048)

Acres	50,394
Ranger district	Wapiti and Greybull
History	Originally part of 02048 Wapiti Valley South, 02047 Sleeping Giant, and 02046 Wapiti Valley East, 1979 RARE II inventory 48,042 acres
Location and access	Located on the south side of the North Fork of the Shoshone River drainage between the drainage and the Washakie Wilderness. Primary access is via U.S. Highway 14, 16, 20 (North Fork Highway). Trail access is via trails 765 (Green Creek Trail), 784 (Clocktower Trail), 785 (Pagoda Creek Trail), 760 (Elk Fork Trail), 758 (Blackwater Trail), 757 (Fishhawk Trail), 756 (Kitty Creek Trail), and 755 (Eagle Creek Trail).
Boundaries	The area is bound by the Washakie Wilderness to the south, the North Fork Highway to the north, and the Forest boundary to the east and west.
Physical and biological description	Terrain consists of low, open grass and sagebrush leading to timbered ridges on the eastern end. Timber increases to the west. A large part of the area consists of openings of grass and sagebrush at the lower elevations and conifers in the western end of the area and at higher elevations. Elevation ranges from 5,700 to 11,000 feet.
Features	Dominant features are the numerous rock formations along the southern edge.
Vegetation	Douglas-fir 49%, grasslands 24%
Recreation	Recreation use is high due to good access via trails and the close proximity of campgrounds and resorts. The recreation opportunity spectrum is semi-primitive non-motorized.
Wildlife	This area provides 47,588 acres of bighorn sheep winter range and 30,657 acres of elk winter range. About 18,200 acres are within the grizzly bear primary conservation area. Portions of lynx analysis units 6 and 7 are within this area. Several wolf packs sporadically occupy the area.
Range	None
Water	Numerous creeks flow into the North Fork of the Shoshone River.
Minerals	19% are administratively withdrawn from oil and gas leasing, 47% are available for oil and gas leasing with no surface occupancy, and 34% are available with other stipulations
Heritage resources	There are four heritage sites in the area.
Special areas	The area contains a portion of the Sheep Mesa potential Research Natural Area.

South Fork (02049)

Acres	66,909
Ranger district	Wapiti
History	Originally part of 02049 South Fork and 02050 Piney Pass, 1979 RARE II inventory 58,847 acres
Location and access	Located on the eastern boundary of the Shoshone National Forest, west and east of the South Fork of the Shoshone River. Primary access is via forest road 479 (South Fork Road) and forest road 474 (Carter Mountain Road). Trail access is via trail 768 (Ishawooa Creek Trail) and 780 (Aldrich Creek Trail.
Boundaries	The area is bound on the west and south by the Washakie Wilderness and to the north and east by the Forest boundary.
Physical and biological description	Terrain consists of low, open grass and sagebrush leading to timbered ridges. Timber increases to the east. A large part of the area consists of openings of grass and sagebrush at the lower elevations. At the higher elevations, Douglas-fir and some lodgepole and limber pine are found on the south-facing slopes. Spruce and fir occur on the north-facing slopes. Elevation ranges from 6,200 feet to 11,300 feet.
Features	The dominant feature is the long and high ridge of Carter Mountain.
Vegetation	Douglas-fir 31%; grasslands 24%; alpine 20%
Recreation	Recreation use is moderate with higher use during hunting seasons. Portions of the area are in recreation opportunity spectrum semi-primitive non-motorized, semi-primitive motorized, and roaded natural.
Wildlife	This area provides winter habitat for deer, elk, and bighorn sheep as well as secure habitat for grizzly bears. About 30,470 acres are in the grizzly bear primary conservation area, about 54,050 acres provide bighorn sheep winter range, and 41,663 acres are elk winter range. Several migration routes for deer, elk, and bighorn sheep occur within this area. The entire area is within lynx analysis unit 19. Approximately two miles of streams and creeks are important to the recovery of the Yellowstone cutthroat trout.
Range	Portions of nine active allotments and associated developments (fences, spring developments) are in this area.
Water	Numerous creeks in the area drain into the South Fork of the Shoshone River.
Minerals	62% are available for oil and gas leasing with no surface occupancy, 38% are available with other stipulations
Heritage resources	There is one heritage site in the area.
Special areas	None

Carter Mountain (02050)

Acres	9,930
Ranger district	Wapiti and Greybull
History	Originally part of 02049 South Fork, 1979 RARE II inventory 7,590 acres
Location and access	Located on the eastern boundary of the Shoshone National Forest, west and east of the South Fork of the Shoshone River. Primary access is via forest roads 474 (Carter Mountain Road) and 211. There is no trail access
Boundaries	The area is bound on the north, east, and south by the Forest boundary and on the west by the Forest boundary and area 02049.
Physical and biological description	Terrain consists of low, open grass and sagebrush leading to timbered ridges. A large portion of the area consists of openings of grass and sagebrush at the lower elevations. Conifers are found at the higher elevations. Elevation ranges from 7,700 to 11,300 feet.
Features	The dominant feature is the long and high ridge of Carter Mountain.
Vegetation	Alpine 41%, spruce/fir 18%, grasslands 15%
Recreation	Recreation use is moderate with higher use during the hunting seasons. Portions of the unit are recreation opportunity spectrum semi-primitive motorized, semi-primitive non-motorized, and roaded natural.
Wildlife	About 7,020 acres are within bighorn sheep winter range and 4,242 acres are elk winter range. The area is within lynx analysis unit 19. The Carter Mountain wolf pack occupies some of this area.
Range	Portions of one active allotment and associated developments (fences, spring developments) are in this area.
Water	There are several creeks and one lake in this area.
Minerals	49% are available for oil and gas leasing with no surface occupancy, 51% are available with other stipulations
Heritage resources	There is one heritage site in this area.
Special areas	None

Franc's Peak (02051)

Acres	67,968
Ranger district	Greybull
History	Originally part of 02052 Franc's Peak, 1979 RARE II inventory 62,592 acres
Location and access	Located on the eastern boundary of the Shoshone National Forest, southwest of Meeteetse, Wyoming. Primary access is via forest roads 290 (Greybull River Road), 200.3 (Wood River Road), and 204 (Timber Creek Road). Trail access is via trails 643 (Jack Creek Trail), 664 (Timber Creek Trail), and 656.
Boundaries	The area is bound on the north and east by the Forest boundary, on the west by the Washakie Wilderness, and on the south by the Wood River drainage.
Physical and biological description	A large portion of the area consists of open grass and sagebrush. At the higher elevations, spruce is found on the north-facing slopes with scattered areas of lodgepole pine and Douglas-fir. Limber pine is found on many south-facing slopes. Elevation ranges from 7,900 to 12,500 feet.
Features	Dominant features in the area are the high peaks at the western boundary, including Franc's Peak (elevation 13,153 feet).
Vegetation	Alpine 41%, grasslands 12%, spruce/fir 11%, barren 11%
Recreation	Recreation use is low during most of the year with an increase during hunting seasons, especially in the Jack Creek drainage. The recreation opportunity spectrum is semi-primitive non-motorized.
Wildlife	This area covers 6.4 miles of Yellowstone cutthroat trout rivers and streams. It is almost entirely within lynx analysis unit 20. The area provides 22,928 acres of bighorn sheep winter range and 25,470 acres elk winter range.
Range	Portions of five active allotments and associated developments (spring developments, fences) are in the area.
Water	Numerous creeks drain into the Wood River.
Minerals	60% are available for oil and gas leasing with no surface occupancy, 40% are available with other stipulations
Heritage resources	There are 17 heritage sites in this area.
Special areas	The area contains a portion of the eligible wild and scenic Greybull River.

Wood River (02052)

Acres	57,011
Ranger district	Greybull
History	Originally part of 02052 Wood River, 1979 RARE II inventory 51,820 acres
Location and access	Located on the eastern boundary of the Shoshone National Forest, southwest of Meeteetse, Wyoming. Primary access is via forest roads 200.3 (Wood River Road) and 217 (Gooseberry Road). Trail access is via trails 814 (Wood River Trail), 652 (Cascade Creek Trail), 817 (Middle Fork Wood River Trail), 654 (South Fork Wood River Trail), and 651 (North Fork Owl Creek Trail).
Boundaries	The area is bound on the south and west by the Washakie Wilderness, on the east by the Forest boundary, and on the north by the Wood River drainage.
Physical and biological description	Most of the South Fork of the Wood River is lodgepole pine and most of the Middle Fork of the Wood River is Douglas-fir. The higher elevations are predominantly Engelmann spruce with areas of open grass and sagebrush. Elevation ranges from 7,000 to 12,300 feet.
Features	Dominant features include the high peaks in the southwestern portion of the area.
Vegetation	Spruce/fir 25%, alpine 20%, Douglas-fir 17%, barren 12%
Recreation	Recreation use is low during most of the year and increases during hunting seasons. The historic mining town of Kirwin attracts visitors to the Wood River drainage at the boundary of the area. The majority of this area is recreation opportunity spectrum semi-primitive non-motorized with a few areas semi-primitive motorized and roaded natural.
Wildlife	This area provides 19,442 acres of elk winter range; a small portion (327 acres) is bighorn sheep winter range. This area provides over 17 miles of rivers and creeks that are important to the recovery of the Yellowstone cutthroat trout. The Wyoming Game and Fish Department has mapped a portion of this area as traditional sage grouse habitat.
Range	Portions of five active allotments and associated developments (spring developments, fences) are in this area.
Water	Numerous creeks drain in to the Wood and Big Horn Rivers.
Minerals	61% are available for oil and gas leasing with no surface occupancy, 39% are available with other stipulations
Heritage resources	There are two heritage sites in the area.
Special areas	None

Castle Rock (02053)

Acres	8,206
Ranger district	Wind River
History	Originally part of 02053 Castle Rock, 1979 RARE II inventory 4,529 acres
Location and access	Located on the eastern boundary of the southern portion of the Shoshone National Forest. Primary access is via forest roads 277, 719, and 501. There is no trail access.
Boundaries	The area is bound on the north by the Washakie Wilderness and on the east by the Forest boundary and forest road 277. Forest roads 501 and 719 form the western and southern edges of the area.
Physical and biological description	The majority of the area is a mix of Engelmann spruce, lodgepole pine, and whitebark pine. Elevation ranges from 9,000 to 11,100 feet.
Features	Dominant features include Castle Rock and Bear Creek Falls on the northern boundary of the area.
Vegetation	Spruce/fir 30%, grasslands 18%, lodgepole pine 14%, whitebark pine 13%
Recreation	Recreation is low due to limited developed access. Most use occurs on the small portion of trail 816 (East Fork Trail), which provides access to the Washakie Wilderness, and during hunting seasons. The recreation opportunity spectrum classes are semi-primitive non-motorized and semi-primitive motorized. There are no motorized trails or designated snowmobile trails in the area, which is closed to road/trail snowmobile use.
Wildlife	This area provides 920 acres of bighorn sheep winter range.
Range	Portions of one active allotment and associated developments (fences, spring developments) are in the area.
Water	The area contains a few creeks and a few small lakes.
Minerals	19% are available for oil and gas leasing with no surface occupancy, 81% are available with other stipulations
Heritage resources	None
Special areas	None

Telephone Draw (02054)

Acres	22,147
Ranger district	Wind River
History	Originally part of 02054 Telephone Draw, 1979 RARE II inventory 18,939 acres
Location and access	Located on the northern end of the southern portion of the Shoshone National Forest, between Bear Basin and Double Cabin. Primary access is via forest roads 556, 503, 501, 1A, and 285. Trail access is via trails 848 (Indian Point Trail) and 815.
Boundaries	The area is bound on the north by the Washakie Wilderness and on the east by forest roads 501 and 503. Roads 285, 2H, and 1A form the western edge of the area and the Forest boundary forms the southern edge.
Physical and biological description	Most of the area consists of a mixture of lodgepole pine and Douglas-fir with whitebark pine at the higher elevations. Elevation ranges from 7,800 to 10,000 feet.
Features	Main features include the rugged canyons of the Wiggins Fork and Bear Creek drainages running along the west side of the area.
Vegetation	Douglas-fir 28%, whitebark pine 15%, spruce/fir 14%, lodgepole pine 14%
Recreation	Recreation use in the area is moderate, with most uses occurring on the Indian Point Trail leading to the Washakie Wilderness. Use increases during hunting seasons. The recreation opportunity spectrum class is semi-primitive non-motorized. There are no motorized trails or designated snowmobile trails within this area, and little snowmobile use.
Wildlife	About 5,020 acres are bighorn sheep winter range and 6,120 acres are elk winter range. This area provides nearly 13 miles of creeks important to the recovery of Yellowstone cutthroat trout.
Range	Portions of two active allotments and associated developments (fences, spring developments) are in the area.
Water	Wiggins Fork Creek and a few small creeks run through the area. There is one small lake.
Minerals	28% are available for oil and gas leasing with no surface occupancy, 72% are available with other stipulations
Heritage resources	There are two heritage sites in the area.
Special areas	The Wiggins Fork, an eligible wild and scenic river, is in the area.

Carson Lake (02055)

Acres	4,741
Ranger district	Wind River
History	Originally part of 02055 Carson Lake, 1979 RARE II inventory 3,843 acres
Location and access	Located on the northern end of the southern portion of the Shoshone National Forest, north of the Horse Creek area. Primary access is via forest roads 509, 507, and 504. Trail access is via trails 810 (Horse Creek Trail) and 811.
Boundaries	The area is bound on the north by the Washakie Wilderness and on the west, south, and east by forest roads.
Physical and biological description	Most of the area consists of Engelmann spruce and whitebark pine with some stands of lodgepole pine. There are some areas of Douglas-fir on the east side of the area. Elevation ranges from 8,000 to 9,700 feet.
Features	Prominent features include Elkhorn Ridge, Carson Lake, Ramshorn Basin, and Deacon Meadows.
Vegetation	Spruce/fir 41%, Douglas-fir 14%, whitebark pine 17%, grasslands 14%
Recreation	Recreation use in the area is moderate, with most uses occurring on the Horse Creek Trail, which leads to the Washakie Wilderness. There are no motorized trails in the area and one ungroomed snowmobile trail. Snowmobile use in the area is low. The recreation opportunity spectrum classes are roaded natural and semi-primitive motorized.
Wildlife	A small portion (83 acres) is within the grizzly bear primary conservation area. Most of this area is within lynx analysis unit 1 and a small portion is within lynx analysis unit 9. There are elk and deer migration routes through this area. Approximately 339 acres are winter range for bighorn sheep.
Range	Portions of two active allotments and associated developments (fences, spring developments) are in the area.
Water	Horse Creek runs through the area, as well as a few smaller creeks. There are a few small lakes.
Minerals	32% are available for oil and gas leasing with no surface occupancy, 68% are available with other stipulations
Heritage resources	None
Special areas	None

East Dunoir (02056)

Acres	6,034
Ranger district	Wind River
History	Originally part of 02056 East Dunoir, 1979 RARE II inventory 3,251 acres
Location and access	Located on the northern end of the southern portion of the Shoshone National Forest, just south of Ramshorn Peak. Primary access is via forest roads 510, 511, and 512.
Boundaries	The area is bound on the north by the Washakie Wilderness and area 02058, on the east and south by forest roads, and on the west by the Forest boundary.
Physical and biological description	The area is timbered with a mix of lodgepole pine, Engelmann spruce, and whitebark pine. Elevation ranges from 8,400 to 10,500 feet.
Features	The main feature is Ramshorn Peak (elevation 11,600 feet) at the area's northern boundary, and Ramshorn Lakes.
Vegetation	Spruce/fir 56%, lodgepole pine 21%, whitebark pine 10%
Recreation	Recreation use is moderate. Most uses occur during hunting seasons. There are no motorized trails or snowmobile trails and little snowmobile use in this area. The recreation opportunity spectrum is semi-primitive motorized and semi-primitive non-motorized.
Wildlife	This area contains 317 acres of bighorn sheep winter range and 1,344 acres are within the grizzly bear primary conservation area. This area is completely within lynx analysis units 11 and 12.
Range	Portions of two active allotments and associated developments (spring developments, fences) are in the area.
Water	There are a few creeks and lakes in the area.
Minerals	15% are available for oil and gas leasing with no surface occupancy, 85% are available with other stipulations
Heritage resources	None
Special areas	None

South Dunoir (02057)

Acres	3,111
Ranger district	Wind River
History	Originally part of 02057 South Dunoir, 1979 RARE II inventory 2,894 acres
Location and access	Located on the northern end of the southern portion of the Shoshone National Forest in the southern Dunoir area. There is no road access to the area; primary access is via trails 808, 809, and 835.
Boundaries	The area is bound on the north and east by the Dunoir area, on the west by West Dunoir Creek, and on the south by the Forest boundary.
Physical and biological description	The area is timbered with some limber pine and areas of mixed Douglas-fir and lodgepole pine. Elevation ranges from 8,000 to 9,000 feet.
Features	The main features are the East Fork of Dunoir Creek and Esmond Park.
Vegetation	Douglas-fir 37%, lodgepole pine 26%, grasslands 4%, spruce/fir 13%
Recreation	Recreation use is low. Most uses occur during hunting seasons. There are no motorized trails and little snowmobile use in the area. The recreation opportunity spectrum is semi-primitive non-motorized.
Wildlife	The entire area is within the grizzly bear primary conservation area and lynx analysis unit 12. Deer and elk migrate through this area.
Range	Portions of one active allotment and associated developments (fences, spring developments) are in the area.
Water	East Dunoir and Esmond Creeks run through the area. Trail Lake is in this area.
Minerals	17% are available for oil and gas leasing with no surface occupancy, 83% are available with other stipulations
Heritage resources	None
Special areas	None

Dunoir (02058)

Acres	28,879
Ranger district	Wind River
History	Originally part of 02058 Dunoir, 1979 RARE II inventory 28,879 acres
Location and access	Located on the northern end of the southern portion of the Shoshone National Forest in the Dunoir drainage. There is no road access. Primary access is by trails 809, 819, 835, 82, 88, and 807.
Boundaries	The area is bound on the north and east by the Washakie Wilderness and on the south and west by the East Dunoir, South Dunoir, and West Dunoir areas.
Physical and biological description	A portion of the area is open with grass and sagebrush. The remainder of the area is a mixture of conifers. Elevation ranges from 8,000 to 11,000 feet
Features	Dominant features are Coffin Butte (elevation 11,000 feet) and Dundee Meadows.
Vegetation	Lodgepole pine 29%, whitebark pine 22%, spruce/fir 21%, alpine 10%
Recreation	This is a popular recreation area for those seeking a back country experience and access to wilderness areas. Uses increase during hunting seasons. There are no motorized trails or designated snowmobile trails. Some cross-country snowmobile use and mountain bike use occurs in the area. The recreation opportunity spectrum class is semi-primitive non-motorized.
Wildlife	This area provides 5,796 acres of bighorn sheep winter range and 29,509 acres of grizzly bear primary conservation area. The entire area is within lynx analysis unit 12. There are several deer, elk, and bighorn sheep migration routes in the area.
Range	Portions of two active allotments and associated developments (fences, spring developments) are in the area.
Water	The West and East Dunoir Creek drainages are in the area, as well as several small lakes.
Minerals	96% are legally withdrawn, 4% are administratively withdrawn from oil and gas leasing
Heritage resources	There is one heritage site in the area.
Special areas	The area contains portions of West Dunoir Creek, an eligible wild and scenic river.

West Dunoir (02059)

Acres	7,115
Ranger district	Wind River
History	Originally part of 02059 West Dunoir, 1979 RARE II inventory 2,443 acres
Location and access	Located on the northern end of the southern portion of the Shoshone National Forest west of the Dunoir drainage. Primary access is via forest roads 552, 513, and 515. There is trail access to the northern portion of the area via trails 808 and 807.1A.
Boundaries	The area is bound on the north by areas 02058, 02903, and 02057 and to the south, east, and west by a series of forest roads.
Physical and biological description	Most of the area is timbered with whitebark pine. There are some scattered stands of conifers. Elevation ranges from 9,000 to 11,000 feet.
Features	The dominant feature is Pinnacle Buttes.
Vegetation	Spruce/fir 36%, whitebark pine 35%
Recreation	The northern portion of the area is popular for those seeking a back country experience and access to the West Dunoir area. Recreation use is moderate. There are no motorized trails or designated snowmobile trails and very little cross-country snowmobile use. Portions of the area are within recreation opportunity spectrum roaded natural, semi-primitive motorized, and semi-primitive non-motorized.
Wildlife	The area provides 794 acres of bighorn sheep winter range. About 4,860 acres are within the grizzly bear primary conservation area. The area is within lynx analysis unit 12.
Range	Portions of two active allotments and associated developments (fences, spring developments) are in the area.
Water	The headwaters of several creeks are within this area.
Minerals	16% are administratively withdrawn from oil and gas leasing, 17% are available with no surface occupancy, and 67% are available with other stipulations
Heritage resources	None
Special areas	None

Sheridan Pass (02060)

Acres	11,746
Ranger district	Wind River
History	Originally part of 02060 Sheridan Pass, 1979 RARE II inventory 7,986 acres
Location and access	Located on the western boundary of the southern portion of the Shoshone National Forest. Road access is via forest roads 537, 538, and 540. There is no trail access.
Boundaries	The area is bound on the north and east by forest roads and on the west and south by the Forest boundary.
Physical and biological description	Most of the area is timbered with some open areas of grass and sagebrush. The timbered areas are mostly stands of whitebark pine and Engelmann spruce. Many rock areas occur. Elevation ranges from 9,000 to 10,500 feet.
Features	Lava Mountain and Pelham Lake are the main features.
Vegetation	Spruce/fir 40%, grasslands 21%, whitebark pine 18%
Recreation	Recreation use is low due to limited access. Most use occurs on the Sheridan Creek Trail; there are no motorized trails. Two groomed and one ungroomed snowmobile trails are in the area. Snowmobile use occurs in the southern portion. The recreation opportunity spectrum includes semi-primitive non-motorized and semi-primitive motorized.
Wildlife	This area is within lynx analysis unit 12. Deer and elk migrate through this area.
Range	Portions of two active allotments and associated developments (fences, spring developments) are in the area.
Water	A few creeks run through the area. Pelham Lake is the only lake.
Minerals	11% are available for oil and gas leasing with no surface occupancy, 89% are available with other stipulations
Heritage resources	There are five heritage sites in the area.
Special areas	This area contains a portion of Warm Spring Creek, an eligible wild and scenic river.

Benchmark (02061)

Acres	8,931
Ranger district	Wind River
History	Originally part of 02061 Benchmark, 1979 RARE II inventory 5,280 acres
Location and access	Located on the eastern border of the Shoshone National Forest. Primary access is via forest roads 531, 554, 524, and 961. There is no trail access.
Boundaries	The area is bound on the west by forest road 531, on the south by the Fitzpatrick Wilderness, on the east by the Forest boundary, and on the north by roaded areas.
Physical and biological description	Most of the area is timbered with areas of Douglas-fir and lodgepole pine at lower elevations and Engelmann spruce and whitebark pine at higher elevations. Elevation ranges from 9,000 to 10,500 feet.
Features	Dominant features are Grandy Reservoir and Windy Mountain.
Vegetation	Spruce/fir 35%, whitebark pine 31%, grasslands 13%, lodgepole pine 8%
Recreation	Recreation use is low due to limited access. Use increases during hunting seasons. There is one motorized trail and one ungroomed snowmobile trail in the area. The recreation opportunity spectrum class is semi-primitive motorized.
Wildlife	The area contains 601 acres of bighorn sheep winter range and 957 acres of elk winter range. The area is within lynx analysis unit 13.
Range	Portions of one active allotment and associated developments (fences, spring developments) are in the area.
Water	Wildcat Creek and its tributaries run through the north portion of the area. Grandy Reservoir is the only lake.
Minerals	12% are available for oil and gas leasing with no surface occupancy, 88% are available with other stipulations
Heritage resources	None
Special areas	None

Salt Creek (02062)

Acres	7,166
Ranger district	Wind River
History	New area not covered by the 2001 Roadless Conservation Area Rule
Location and access	Located on the western border of the Shoshone National Forest. Primary access is via forest roads 534 and 543. There is limited trail access via trail 561.
Boundaries	The area is bound on the west and south by the Forest boundary and on the north and east by roaded areas.
Physical and biological description	The western side of the area consists largely of open grass and sagebrush. The remainder of the area is predominantly Engelmann spruce and whitebark pine with some scattered lodgepole pine. Elevation ranges from 9,000 to 10,000 feet.
Features	The main feature is Fish Lake Mountain along the western boundary.
Vegetation	Grasslands 36%, spruce/fir 22%, shrub 17%, sagebrush 10%
Recreation	Recreation use is low. Most use occurs during hunting seasons. The area contains two groomed snowmobile trails and no motorized trails. The recreation opportunity spectrum is semi-primitive motorized.
Wildlife	The area is within lynx analysis unit 13.
Range	Portions of two active allotments and associated developments (fences, spring developments) are in the area.
Water	Salt Creek and its tributaries run through the southern portion of the area.
Minerals	8% are available for oil and gas leasing with no surface occupancy, 92% are available with other stipulations
Heritage resources	None
Special areas	None

Little Popo Agie (02064)

Acres	10,737
Ranger district	Washakie
History	Originally part of 02064 Little Popo Agie, 1979 RARE II inventory 8,060 acres
Location and access	Located on the southeastern border of the Shoshone National Forest. Primary access is via forest roads 352, 361, 364, and 326. Trail access is via motorized trail 907 (Wolf Trail).
Boundaries	The area is bound on the west and south by forest roads 352 and 361, on the north by forest road 364, and on the east by forest road 326.
Physical and biological description	The area is timbered with Douglas-fir at the higher elevations and lodgepole pine at the lower elevations. Elevation ranges from 7,000 to 9,200 feet.
Features	Dominant features are Little Popo Agie Canyon and Freak Mountain.
Vegetation	Douglas-fir 52%, grasslands 17%, lodgepole pine 15%
Recreation	Recreation use in this area is low due to limited access. There are no groomed snowmobile trails and very little snowmobile use. There is one motorized trail. The recreation opportunity spectrum classes are semi-primitive motorized, semi-primitive non-motorized, and roaded natural.
Wildlife	This area provides 1,557 acres of elk winter range and 359 acres of bighorn sheep winter range. There are deer and elk migration routes through the area.
Range	Portions of three active allotments and associated developments (fences, spring developments) are in the area.
Water	The Little Popo Agie River and several creeks flow through the area.
Minerals	35% are available for oil and gas leasing with no surface occupancy, 65% are available with other stipulations
Heritage resources	There are nine heritage sites in the area.
Special areas	None

Canyon Creek (02065)

Acres	8,662
Ranger district	Washakie
History	Originally part of 02065 Canyon Creek, 1979 RARE II inventory 7,237 acres
Location and access	Located on the southern end of the Shoshone National Forest. Primary access is via forest roads 352, 354, and 300 (Loop Road). There is no trail access.
Boundaries	The area is bound on the west by the Loop Road, on the south and east by forest roads 352 and 354, and on the north by roaded areas.
Physical and biological description	Most of the area is timbered with lodgepole pine with some Douglas-fir. Whitebark pine stands are scattered throughout the area. Elevation ranges from 8,700 to 9,200 feet.
Features	The dominant feature is Meyer Lookout in the northern portion of the area.
Vegetation	Lodgepole pine 68%, Douglas-fir 9%, whitebark pine 8%
Recreation	Recreation is low due to limited access. There are no motorized trails and one groomed snowmobile trail, with very little cross-country snowmobile use. The recreation opportunity spectrum classes are semi-primitive motorized and roaded natural.
Wildlife	Deer and elk migration routes occur in this area.
Range	Portions of three active allotments and associated developments (fences, spring developments) are in the area.
Water	Several streams run through the area and there are some small lakes at the southern end.
Minerals	17% are available for oil and gas leasing with no surface occupancy, 83% are available with other stipulations
Heritage resources	None
Special areas	None

Pass Creek (02066)

Acres	4,208
Ranger district	Washakie
History	Originally part of 02066 Pass Creek, 1979 RARE II inventory 2,991 acres
Location and access	Located in the southeast corner of the Shoshone National Forest. Primary access is via forest roads 352, 354, 366, and 367. There is no trail access.
Boundaries	The area is bound on the west and north by forest roads 354 and 367, on the south by forest road 366, and on the east by forest road 326 and private land.
Physical and biological description	Most of the area is timbered with lodgepole pine with some Douglas-fir at higher elevations. Elevation ranges from 7,700 to 9,000 feet.
Features	The main feature is the Pass Creek drainage.
Vegetation	Lodgepole pine 59%, grasslands 13%, aspen 9%
Recreation	Recreation use is low due to the lack of trail access. There are no motorized trails or groomed snowmobile trails in the area. Snowmobile use is low. The Recreation Opportunity spectrum class is semi-primitive motorized.
Wildlife	Several deer and elk migration routes are in the area.
Range	Portions of four active allotments and associated developments (fences, spring developments) are in the area.
Water	Two creeks are within the area.
Minerals	17% are available for oil and gas leasing with no surface occupancy, 83% are available with other stipulations
Heritage resources	There are nine heritage sites in the area.
Special areas	None

Middle Fork (02901)

Acres	59,722
Ranger district	Washakie
History	Originally part of 02901 Middle Fork, 1979 RARE II inventory 48,650 acres
Location and access	Located along the eastern and southern boundary of the Popo Agie Wilderness on the southern end of the Shoshone National Forest. Primary access is via forest roads 350, 351, 334, 329, 306, and 355. Trail access is via trails 724 (Louis Lake Trail), 910 (Pine Creek Trail), 721 (Christina Lake Trail), 701 (Sheep Bridge Trail), 700 (Middle Fork Trail), 711 (Shoshone Lake Trail), 710 (North Fork Trail), 750, and 716.
Boundaries	The area is bound on the west by the Popo Agie Wilderness and the Bridger-Teton National Forest. It is bound on the north, east, and south by the Forest boundary, other areas, and roaded areas.
Physical and biological description	Most of the area is timbered with lodgepole pine. Several whitebark pine stands are scattered throughout the area. Elevation ranges from 8,000 to 11,100 feet.
Features	Dominant features are the granite cliffs and outcrops of the Wind River Mountains, several high peaks within the southwest portion of the area, and Christina and Shoshone Lakes.
Vegetation	Lodgepole pine 56%, whitebark pine 22%
Recreation	Recreation use in the area can be moderate to high and includes hiking, camping, horseback riding, and hunting. The area provides several trails that offer access to the Popo Agie Wilderness. There are two motorized trails in the northern portion. Snowmobiling is allowed within the entire area; most use occurs south of the Middle Fork of the Popo Agie River. There are four groomed snowmobile trails. The recreation opportunity spectrum classes are semi-primitive motorized and semi-primitive non-motorized.
Wildlife	Several deer and elk migration routes are within the area, as well as 648 acres of elk winter range. There is an active goshawk nest in this area.
Range	Portions of six active allotments and associated developments (fences, spring developments) are in the area.
Water	The Little Popo Agie River, Middle Fork of the Popo Agie River, and the North Fork of the Popo Agie River flow out of the Wind River Mountains through this area. There are numerous lakes within the area.
Minerals	1% is administratively withdrawn from oil and gas leasing, 22% are available for oil and gas leasing with no surface occupancy, and 77% are available with other stipulations
Heritage resources	There are two heritage sites within the area.
Special areas	The area contains a portion of the Middle Fork of the Popo Agie River, an eligible wild and scenic river.

Warm Spring Creek (02902)

Acres	6,026
Ranger district	Wind River
History	Originally 02902 Warm Spring Creek, 1979 RARE II inventory 5,545 acres
Location and access	Located on the western border of the Shoshone National Forest. Primary access is via forest roads 263, 531, and 2C.
Boundaries	The area is bound on the west and south by the Forest boundary and on the north and east by roaded areas.
Physical and biological description	Most of the area is timbered with Engelmann spruce and whitebark pine with open areas of willow and grass on the west side of the area. Elevation ranges from 9,200 to 11,500 feet.
Features	Features include Union Peak (elevation 11,491 feet) along the southwest boundary and Moon and Union Lakes.
Vegetation	Spruce/fir 41%, forbs 19%, whitebark pine 17%
Recreation	Recreation use is low due to limited access. There are no motorized trails. There are two groomed and one ungroomed snowmobile trails in the area. The recreation opportunity spectrum classes are semi-primitive non-motorized and roaded natural.
Wildlife	The area contains about 162 acres of bighorn sheep winter range. Most of the area is within lynx analysis unit 13.
Range	Portions of one active allotment and associated developments (fences, spring developments) are in the area.
Water	The South Fork of Warm Springs Creek runs through the area. Union and Moon Lakes are in the area.
Minerals	14% are available for oil and gas leasing with no surface occupancy, 86% are available with other stipulations
Heritage resources	None
Special areas	None

Togwotee Pass (02903)

Acres	6,888
Ranger district	Wind River
History	Originally part of 02903 Togwotee Pass, 1979 RARE II inventory 6,802 acres
Location and access	Located on the northern end of the southern portion of the Shoshone National Forest in the Brooks Lake area. Road access is via forest roads 515 and 516. Primary trail access is via trails 823, 823.1A, and 823.1B.
Boundaries	The area is bound on the north by the Washakie Wilderness, on the west and south by forest roads, and on the east by area 02058.
Physical and biological description	Most of the area is timbered with whitebark pine and a few stands of Engelmann spruce. Elevation ranges from 9,000 to 10,000 feet.
Features	Dominant features are Sublette Peak and numerous back country lakes.
Vegetation	Whitebark pine 56%, spruce/fir 16%, alpine 7%
Recreation	This area is popular for those seeking a back country experience and access to back country lakes and the Teton Wilderness. Trail 823 is part of the Continental Divide National Scenic Trail and is a popular hiking trail. There are no motorized trails or designated snowmobile trails. Snowmobiling and cross-country skiing are popular uses. The recreation opportunity spectrum is semi-primitive non-motorized.
Wildlife	This area is within lynx analysis unit 12. Approximately 193 acres are bighorn sheep winter range. About 6,460 acres are within the grizzly bear primary conservation area.
Range	There is one active allotment and associated developments (fences, spring developments) are in the area.
Water	Brooks Lake Creek runs through the area. There are several lakes.
Minerals	85% are administratively withdrawn from oil and gas leasing, 3% are available for oil and gas leasing with no surface occupancy, and 12% are available with other stipulations
Heritage resources	There are eight heritage sites in the area.
Special areas	None

Deep Lake (02911)

Acres	59,206
Ranger district	Clarks Fork
History	Originally part of 02911 South Beartooth Highway, 1979 RARE II inventory 56,547 acres
Location and access	Located on the northeast boundary of the Shoshone National Forest. Primary access is via U.S. Highway 212 (Beartooth Highway). Trail access is via trails 613, 623, 629, 613.1, 613.1A, 613.1B, 613.1C, and 613.1D.
Boundaries	The Wyoming-Montana state line and the Beartooth Highway form the northern boundary, forest road 120 (Morrison Jeep Trail) runs along the western boundary, the Clarks Fork River runs along the southern boundary, and the eastern boundary follows the old RARE II boundary and private land.
Physical and biological description	The terrain and topography vary from alpine plateau and lakes, rock outcrops, and the timbered face of the Beartooth range. The area consists of open alpine tundra on the top of the Beartooth plateau interspersed with stands of conifers. The face of the Beartooth plateau is more heavily timbered with a mix of timber types and several steep drainages. Elevation ranges from 5,000 to 10,500 feet.
Features	The dominant features in this area are alpine lakes and rock outcroppings.
Vegetation	Alpine 29%, grasslands 18%, spruce/fir 15%, Douglas-fir 14%, whitebark pine 11%
Recreation	There are several trails within the area and primitive recreation opportunities abound. The majority of recreation use is low and includes hiking, camping, fishing, and hunting. The Beartooth Loop National Recreation Trail and the Deep Lake Trail are popular trails for hikers and backpackers who want to experience the remote high country of the Beartooth Mountains. The Morrison Jeep Trail runs along the western boundary of the unit and although it does not fall within the area, it is a popular route and allows recreationists to access the area. The recreation opportunity spectrum for this area is semi-primitive non-motorized. There is some cross-country snowmobile use within the unit.
Wildlife	Approximately 6,015 acres of the Deep Lake area are bighorn sheep winter range and 9,296 acres are within the grizzly bear primary conservation area. Most of this area provides habitat for rocky mountain goats. There are several migration corridors for deer, elk, and bighorn sheep. Part of this area is sage grouse habitat.
Range	Portions of four active allotments and associated developments (fences, spring developments) are in the area.
Water	The area is covered with numerous lakes. Little Rock, Bennett, and Line Creeks are the principal perennial streams in the area.
Minerals	1% is legally withdrawn and 4% are administratively withdrawn from oil and gas leasing, 53% are available for oil and gas leasing with no surface occupancy, and 42% are available with other stipulations
Heritage resources	There are four heritage sites in the area.
Special areas	None

North Boundary (02913)

Acres	182
Ranger district	Clarks Fork
History	Originally part of North Boundary area 02913, 1979 RARE II inventory 182 acres
Location and access	Located on the northern boundary of the Shoshone National Forest. Primary access via forest road 160.2. There is no trail access.
Boundaries	The Wyoming-Montana state line forms the northern boundary and forest road 160.2 forms the west, south, and east boundaries.
Physical and biological description	The topography includes an alpine drainage below an alpine plateau and lakes. The unit consists of mostly open alpine tundra with areas of conifers scattered throughout. The elevation ranges from 9,000 to 10,000 feet.
Features	The dominant feature is Ladula Creek.
Vegetation	Whitebark pine 55%, grasslands 26%, barren 19%
Recreation	The majority of recreation use is moderate and involves hiking, camping, fishing, and hunting. The recreation opportunity spectrum for the area is primitive.
Wildlife	Almost all this area is bighorn sheep winter range (172 acres).
Range	There is a portion of one active range allotment and associated developments (fences, spring developments) in the area.
Water	Ladula Creek is the only stream in the area.
Minerals	100% are legally withdrawn from oil and gas leasing
Heritage resources	None
Special areas	None

Reef (02914)

Acres	16,915
Ranger district	Clarks Fork
History	Originally 02914 Reef, 1979 RARE II inventory 15,807 acres
Location and access	Located in the northwest portion of the Shoshone National Forest. Primary access is via U.S. Highway 212 (Beartooth Highway), State Highway 296 (Chief Joseph Highway), and forest road 117 (Squaw Creek Road). Trail access is via trails 610 and 611.
Boundaries	The unit is bound by the Beartooth and Chief Joseph Highways on one side and the North Absaroka Wilderness on the other.
Physical and biological description	Most of the topography is steep. Elevation ranges from 7,000 to 10,000 feet.
Features	The dominant feature is the cliff face, which forms a rim along a large portion of the slope within this area.
Vegetation	Douglas-fir 25%, lodgepole pine 22%, barren 18%, grasslands 15%
Recreation	The amount of recreation use is low and includes hiking and camping along trails 610 and 611. The recreation opportunity spectrum for this area is semi-primitive non-motorized.
Wildlife	Approximately 4,495 acres of the Reef area are within bighorn sheep winter range and 1,987 acres provide winter range for elk. There are several migration corridors for deer, elk, and bighorn sheep. Part of the area is sage grouse habitat, and all acres are in the grizzly bear primary conservation area.
Range	There are portions of two active allotments and associated developments (fences, spring developments).
Water	Pilot, One Mile, Squaw, and North Crandall Creeks are the primary creeks.
Minerals	1% is administratively withdrawn from oil and gas leasing, 92% are available for oil and gas leasing with no surface occupancy, and 7% are available with other stipulations
Heritage resources	None
Special areas	None

High Lakes Wilderness Study Area and High Lakes addition
(Areas NF915 and NF915a)

Acres	High Lakes Wilderness Study Area (WSA) 15,224 High Lakes addition 5,402
Ranger district	Clarks Fork
History	Originally part of NF915 Beartooth proposed wilderness, 1979 RARE II inventory 15,224 acres (High Lakes WSA) and 0 acres (High Lakes addition)
Location and access	Located on the northern boundary of the Shoshone National Forest. Primary access is via U.S. Highway 212 (Beartooth Highway). Trail access is via trails 619, 620, and 625.
Boundaries	The Wyoming-Montana state line forms most of the northern boundary, the Beartooth Highway runs along the south and southeast boundaries, and the Absaroka Beartooth Wilderness runs along the western boundary.
Physical and biological description	The terrain and topography vary from alpine plateau and lakes to granite peaks and walls. Mostly open, alpine tundra with areas of conifers scattered throughout. Elevation ranges from 9,000 to 10,500 feet.
Features	The dominant features in this area are the Beartooth Butte, numerous high mountain lakes, and granite peaks.
Vegetation	High Lakes WSA alpine 29%, grasslands 20%, barren 18% High Lakes addition grasslands 37%, spruce/fir 19%, whitebark pine 13%
Recreation	There are several trails within the area and primitive recreation opportunities abound. The majority of recreation use is moderate and involves hiking, camping, fishing, hunting, and snowmobiling. Trails 619 and 621 leading from Beartooth Lake Campground and trail 620 leading from Island Lake Campground are popular routes for hikers and backpackers who want to experience the remote high country of the Beartooth Mountains. There is some cross-country snowmobile use within the units.
Wildlife	A large portion of this area is within lynx analysis unit 1. The Wyoming Game and Fish Department has delineated part of this area as sage grouse habitat. The Beartooth wolf pack sporadically occupies this area. Approximately 2,137 acres are bighorn sheep winter range and 14,364 acres are in the grizzly bear primary conservation area.
Range	There is a portion of one active allotment and associated developments (spring developments, fences) in the area.
Water	The area is covered with numerous lakes. Beartooth Creek is the only significant perennial stream in the area.
Minerals	100% of the High Lakes WSA are legally withdrawn from oil and gas leasing. In the High Lakes addition, 43% are administratively withdrawn from oil and gas leasing, 20% are available for oil and gas leasing with no surface occupancy, and 37% are available with other stipulations.
Heritage resources	None
Special areas	The High Lakes Wilderness Study Area

Appendix D. Wild and Scenic River Eligibility Evaluation, Shoshone National Forest

United States
Department of
Agriculture

Forest Service

Rocky Mountain Region

2012

Wild and Scenic River Eligibility Evaluation

Shoshone National Forest

April 2012

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Introduction

This report documents the wild and scenic river eligibility evaluation for the Shoshone's forest plan revision. The direction to conduct an eligibility evaluation comes from the Wild and Scenic Rivers Act of 1968 (Act).[1]

The Act directs federal agencies to identify potential additions to the National Wild and Scenic Rivers System (National System) in Section 5(d)(1):

> In all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic, and recreational river areas, and all river basin and project plan reports submitted to the Congress shall consider and discuss any such potentials. The Secretary of the Interior and the Secretary of Agriculture shall make specific studies and investigations to determine which additional wild, scenic and recreational river areas within the United States shall be evaluated in planning reports by all Federal agencies as potential alternative uses of the water and related land resources involved.

Forest Service policy

The Forest Service developed guidance for Wild and Scenic River evaluation in the directive system in Forest Service Handbook 1909.12, chapter 80. This handbook requires the land management planning process to include a comprehensive evaluation of the potential for rivers in an administrative unit to be eligible for inclusion in the National System. It lists sources for identifying the significance of river-related values, including the Nationwide Rivers Inventory; state river assessments; identification by tribal governments, other federal, state, or local agencies; and the public (81.2).

The land management planning team is to develop and conduct a process to determine which rivers meet the eligibility criteria specified in sections 1(b) and 2(b) of the Act. Upon completion of a systematic inventory of eligible rivers, the timing of conducting the suitability process may vary. The preferred process is to proceed with determining suitability in the land management planning process. An alternative is to delay the suitability determination of eligible rivers until a subsequent separate study is completed. If such delay is warranted, the land management plan shall provide for protection of the eligible river corridor until a decision is made on the future use of the river and adjacent lands (83.1).

Background

Congress enacted the Act to preserve select rivers' free-flowing conditions, water quality, and outstandingly remarkable values. The most important provision of the Act is protecting rivers from the harmful effects of water resources projects. To protect free-flowing character, the Federal Energy Regulatory Commission (which licenses nonfederal hydropower projects) is not allowed to license construction of dams, water conduits, reservoirs, powerhouses, transmission lines, or other project works on or directly affecting wild and scenic rivers. Other federal agencies may not assist by loan, grant, license, or otherwise any water resources project that would have a direct and adverse effect on the values for which a river was designated.

The Act also directs that each river in the National System be administered in a manner to protect and enhance a river's outstanding natural and cultural values. It allows existing uses of a river to continue and future uses to be considered, so long as existing or

[1] Public Law 90-542.

proposed use does not conflict with protecting river values. The Act also directs building partnerships among landowners, river users, tribal nations, and all levels of government.

Rivers may be identified for study by an act of Congress under Section 5(a), or through federal agency-initiated study under Section 5(d)(1). By the end of 2002, Congress had authorized 138 rivers for study. Section 5(d)(1) directs federal agencies to consider the potential of wild and scenic rivers in their planning processes.

Both Sections 5(a) and 5(d)(1) studies require determinations to be made regarding a river's eligibility, classification, and suitability. Eligibility and classification represent an inventory of existing conditions. Eligibility is an evaluation of whether a river is free-flowing and possesses one or more outstandingly remarkable values. If found eligible, a river is analyzed as to its current level of development (water resources projects, shoreline development, and accessibility) and a recommendation is made that it be placed into one or more of three classes–wild, scenic, or recreational.

In this evaluation, only eligibility of rivers on the Shoshone National Forest is completed. All rivers found eligible have also been classified and appropriate protections applied. Suitability is deferred, pending:

1. Public interest or support in wild and scenic river study, and
2. Congress expresses interest in a specific river for wild and scenic river designation, or
3. A proposed project would alter the free-flowing character of a stream, such as by impoundment, or adversely affect outstandingly remarkable values, or the river's inventoried classification (82.5)

Identification of potentially eligible rivers

Section 5(d)(1) requires consideration of potential wild and scenic rivers in all federal agency planning for water and land resources. There is no single approach to developing and documenting a forest-wide assessment of potential additions to the National System. Given the objective of determining which river-related values are unique, rare, or exemplary at a comparative regional or national scale, there are a number of sources of information to consider when designing an evaluation approach.

- Forest Service information about river-related values based on special areas and designations in the initial forest plan. That is, consider the significance of river-related values in areas identified as having special natural, cultural, or recreational values.
- Other agency information about river-related values based on agency-specific or area plans (e.g., significance of aquatic species/habitat provided by a federal or state fish agency).
- Nonprofit information based on comparative analysis (e.g., The Nature Conservancy plant and plant-community database and the American Whitewater National Whitewater Inventory[2]).
- Public and nongovernmental organization information provided on the relative significance of river-related values.

The Shoshone National Forest planning team reviewed the Nationwide Rivers[3] Inventory, the American Rivers[4] list, input from the public, nongovernmental organizations, and employees to determine a list of potential eligible rivers. Twenty-six rivers were identified as potentially eligible rivers on the Shoshone National Forest.

[2] http://www.americanwhitewater.org/content/River/view
[3] http://www.nps.gov/ncrc/programs/rtca/nri/
[4] http://www.americanrivers.org

Table 1–Identification of potential eligible river segments

River	Segment
Bear Creek	Headwaters to trailhead
Bull Lake Creek	Headwaters to Forest boundary
Clarks Fork	Forest boundary to Crandall Creek
Crandall Creek	Headwaters to ~ 1 mile past wilderness boundary
Dinwoody Creek	Headwaters to Forest boundary
East Fork Dunoir Creek	Headwaters to Forest boundary
East Fork Wind River	Headwaters to wilderness boundary
	Wilderness boundary to Forest boundary
Frontier Creek	Headwaters to trailhead
Greybull River	Headwaters to ~ 0.5 mile past wilderness boundary
Horse Creek	Headwaters to ~ 1 mile outside wilderness boundary
	~ 1 mile outside wilderness boundary to Forest boundary
Jakeys Fork	Headwaters to Forest boundary
Little Popo Agie River	Headwaters to Forest boundary
Middle Fork Wood River	District boundary to private boundary
Middle Popo Agie River	Headwaters to wilderness boundary
	Wilderness boundary to trailhead
North Crandall Creek	Headwaters to wilderness boundary
North Fork Shoshone River	Wilderness boundary to Forest boundary
North Popo Agie River	Headwaters to Forest boundary
South Fork Shoshone River	Headwaters to wilderness boundary
South Fork Wood River	Headwaters to start of road
	Start of road (ski cabin) to Forest boundary
Sunlight Creek	Park boundary to wilderness boundary
	Wilderness boundary to Spring Creek gate
	Below Spring Creek gate to Sunlight Bridge
	Sunlight Bridge to Clarks Fork River
Warm Spring Creek	Headwaters to Warm Springs canyon
	Warm Spring canyon
West Fork Dunoir Creek	Headwaters to ~ 1.5 miles from Forest boundary
West Torrey Creek	Headwaters to Forest boundary
Wiggins Fork	Headwaters to trailhead
	Trailhead to Forest boundary
Wind River	Portion of the river on the Forest
Wood River	Headwaters to Kirwin
	Kirwin to Forest boundary

Free flowing

The next step of the process was to determine if the 26 potential eligible river segments were free flowing. Forest Service specialists identified impoundments or other structures that would disqualify these rivers as free flowing. Table 2 lists the rivers and identifies their current level of development. A "no" response indicates the river was found to have an impoundment or other structure that disqualified it from meeting the free-flow criteria.

The Act defines free flow as

> . . . existing or flowing in natural condition without impoundment, diversion, straightening, riprapping, or other modifications of the waterways. The existence of low dams, diversions, works, and other minor structures at the time any river is proposed for inclusion in the National System shall not automatically bar its consideration for such inclusion: Provided, that this shall not be construed to authorize, intend, or encourage future construction of such structures within components of the national wild and scenic rivers system.

Table 2–Evaluation of the potential eligible rivers for free-flowing determination

River	Impoundments or other structures	Free-flowing determination
Bear Creek	No impoundments	Free flowing
Bull Lake Creek	No impoundments	Free flowing
Clarks Fork	2 irrigation diversions	Free flowing
Crandall Creek	No impoundments	Free flowing
Dinwoody Creek	No impoundments	Free flowing
East Fork Dunoir Creek	No impoundments	Free flowing
East Fork Wind River	No impoundments	Free flowing
Frontier Creek	No impoundments	Free flowing
Greybull River	No impoundments	Free flowing
Horse Creek	No impoundments	Free flowing
Jakeys Fork	No impoundments	Free flowing
Little Popo Agie River	Dam and ditch	No
Middle Fork Wood River	No impoundments	Free flowing
Middle Popo Agie River	No impoundments	Free flowing
North Crandall Creek	No impoundments	Free flowing
North Fork Shoshone River	1 irrigation diversion	Free flowing
North Popo Agie River	No impoundments	Free flowing
South Fork Shoshone River	No impoundments	Free flowing
South Fork Wood River	No impoundments	Free flowing
Sunlight Creek	2 irrigation diversions	Free flowing
Warm Spring Creek	1 diversion ditch	Free flowing
West Fork Dunoir Creek	No impoundments	Free flowing
West Torrey Creek	No impoundments	Free flowing
Wiggins Fork	No impoundments	Free flowing
Wind River	1 irrigation diversion	Free flowing
Wood River	No impoundments	Free flowing

It was determined that 25 river segments had no significant impoundments or other structures and were free flowing. The remaining river segment, Little Popo Agie River, was found to have a significant impoundment and was disqualified.

Outstandingly remarkable values

The next step was to decide on eligibility criteria and consider whether each potentially eligible river had an outstandingly remarkable value (or values). To help in identifying an outstandingly remarkable value (or values) the planning team used the criteria in Forest Service Handbook 1909.12, 82.14a and identified additional factors to make it meaningful for application on the Shoshone National Forest, which served as the area of consideration for the comparative analysis.

Outstandingly remarkable values are unique, rare, or exemplary features that are significant at a comparative regional or national scale. Outstandingly remarkable values must be related to the river or its immediate environment. The seven outstandingly remarkable values and their attributes are:

1. **Scenery**– The landscape elements of landform, vegetation, water, color, and related factors result in notable or exemplary visual features and/or attraction within the nation or region. When analyzing scenic values, additional factors such as seasonal variations in vegetation, scale of cultural modifications, and the length of time negative intrusions are viewed may be considered. Scenery and visual attractions may be highly diverse over the majority of the river or river segment.

   Attributes for scenery outstandingly remarkable values– Consider the presence of high relief landforms with unusual or outstanding topographic features and still or cascading water that is dominant in the landscape. River corridors with the greatest diversity and variety of views both foreground and background are of higher value. River corridors with high relief and focal points that are visually striking, particularly memorable, or rare in the region are of higher value. River corridors with the greatest seasonal variation and diversity are of higher value. Viewsheds that are free from aesthetically undesirable sights and influences are generally of higher values.

2. **Recreation**–Recreation opportunities are or have the potential to be unique enough to attract visitors from outside the geographic region. Visitors would be willing to travel long distances to use the river resources for recreational purposes. River-related opportunities could include, but are not limited to sightseeing, wildlife observation, camping, photography, hiking, tubing, floating, boating, paddling, fishing, and hunting. Interpretive opportunities may be exceptional and attract or have the potential to attract visitors from outside the geographic region. The river may provide or have the potential to provide settings for national or regional competitive events.

   Attributes for recreation outstandingly remarkable values–Consider the amount of time the river corridor is used or available for recreation purposes, the number and variety of recreation uses, the number of similar experiences available in the region, availability of private and public access points, and the ability to attract visitors from outside the region. Rivers with the longest season of use are of higher value. Rivers that provide for the largest number and diversity of recreation uses are of higher value. Rivers that provide the most unique opportunities are of higher value. Rivers or corridors highly used by anglers, hunters, and wildlife viewers are usually of higher value.

3. **Geology**– The river or corridor contains an example of a geologic or hydrologic feature, process, or phenomenon that is rare or unique to the region, or an outstanding example of a commonly occurring feature. The feature may represent a textbook example.

   Attributes for geology outstandingly remarkable values–Consider landforms and geologic setting with unusual or outstanding geologic features, the number and variety of special geologic features, and the value of these features to the region. River corridors with an abundance of unusual, unique, and distinctive geologic features to the region are of higher value. River corridors with the greatest diversity of geologic features are of higher value.

4. **Fish**– Fish values may be judged on the relative merits of fish populations, habitat, or a combination of these factors. Consideration should be given to potential as well as existing values.

   Attributes for fish outstandingly remarkable values– Consider the presence, extent, and carrying capacity of spawning areas, rearing areas, and adult habitat. Consider the number and variety of species present and the value of these species. Areas with the greatest amount and best habitat are of higher value. Rivers with more fish and/or have sizeable runs are of higher value. Rivers highly used by anglers or that offer unusual recreation experiences for the region are of higher value.
5. **Wildlife**– Wildlife values may be judged on the relative merits of wildlife populations, habitat, or a combination of these factors. Consideration should be given to potential as well as existing values. River corridor contains nationally or regionally important populations of resident or indigenous wildlife species dependent on the river environment.

   Attributes for wildlife outstandingly remarkable values– Consider the presence, extent, and carrying capacity of a variety of wildlife habitats, including winter range, summer range, transition zones, travel corridors, and calving areas. Consider the number and variety of species present and the value of these species. River corridors with the greatest and best habitat and habitat for rare species are of higher values. River corridors with the greatest diversity of species or the greatest number of wildlife are of higher value.
6. **Prehistory**–the river, or area within the corridor, contains a site or sites where there is evidence of occupation or use by Native Americans.
7. **History**–the river, or area within the corridor, contains a site or feature associated with a significant event, an important person, or a cultural activity of the past that was a rare or one-of-a-kind in the region.

Forest Service specialists reviewed the 25 potential eligible rivers to assess whether the segments had one or more of these seven outstandingly remarkable values.

Outstandingly remarkable values significance

The planning team then evaluated each of the potentially eligible rivers with an identified outstandingly remarkable value (or values) to determine whether one or more value was regionally or nationally significant:

- Regional importance–the value is important in the Greater Yellowstone Area
- National importance–the value is important nationally

As a result of this process, 13 rivers were found to possess one or more outstandingly remarkable values of regional or national importance and are therefore eligible for the National System.

Eligible river documentation

The planning team developed descriptions documenting the outstandingly remarkable values and classification for each of the 13 river segments. That information follows Table 3, which summarizes the values for the 13 river segments.

The 13 river segments, their outstandingly remarkable values, and classifications were presented to the public during forest plan revision meetings. Because of public comment, the classification of one river segment was changed.

The 13 river segments are shown in attachment A–Maps.

Classification

Each of the 13 eligible river segments were then classified into a category. Section 2(b) of the Act specifies and defines three classification categories for eligible rivers: wild rivers, scenic rivers, and recreational rivers.

The potential classification of a river found to be eligible is based on the condition of the river and the adjacent lands.

Table 3–River segments having ORVs and regional or national importance

River	Segment	Outstandingly remarkable value(s) Outstandingly remarkable value(s) rating			Classification
Clarks Fork	Forest boundary to Crandall Creek	wildlife high regional	scenery high national	recreation high regional	recreational
Dinwoody Creek	Headwaters to Forest boundary	scenery high regional			wild
Greybull River	Headwaters to ~0.5 mile past wilderness boundary	recreation high regional	fish high regional		wild
Middle Popo Agie River	Wilderness boundary to trailhead	scenery high regional	recreation high regional		recreational
North Fork Shoshone River	Wilderness boundary to Forest boundary	recreation high national	wildlife high national	history high national	recreational
South Fork Shoshone River	Headwaters to wilderness boundary	recreation high regional	fish high regional	wildlife high national	wild
Sunlight Creek	Wilderness boundary to Spring Creek gate	wildlife high regional			scenic
Warm Spring Creek	Headwaters to Warm Spring canyon	history high regional			recreational
Warm Spring Creek	Warm Spring canyon	scenery high national	history high national		scenic

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River	Segment	Outstandingly remarkable value(s) Outstandingly remarkable value(s) rating			Classification
West Fork DuNoir Creek	Headwaters to ~1.5 miles from Forest boundary	wildlife high national	history high national		wild
Wiggins Fork	Trailhead to Forest boundary	scenery high regional	geology high regional		scenic
Wood River	Kirwin to Forest boundary	recreation high regional	history high regional	fish high regional	recreational

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Descriptions of the eligible segments

Clarks Fork River

Location

The length of river studied flows southeast from the Montana border along U S Highways 212 and State Highway 296 to the beginning point of the designated wild segment of the Clarks Fork of the Yellowstone River in T58N, R107W, T57N, R107W, T57N, R106W and T56N, R106W.

See the map on page 3 of attachment A.

Mileage

Studied: 17 miles (15 National Forest System, 2 private)

The complete length studied was determined to be eligible.

Flow

There are two irrigation diversions with headgates along this segment of the river; they do not affect the natural and riverine appearance of the river.

Outstandingly remarkable values

This river segment's scenery is important nationally due to its proximity next to the Beartooth All American Road (U S Highway 212) and the Chief Joseph Scenic Highway (State Highway 296). These roads follow the Clarks Fork of the Yellowstone River with high mountain peaks in the background and very little development along the river's shores. Many national and international visitors follow this recreational corridor as they make their way into Yellowstone National Park. Recreation is important regionally in this corridor. Easy access to the river along a significant portion of the upper section and large numbers of developed recreation facilities draw visitors and variety of recreational use. Recreational use ranges from anglers, to campers, to some recreation paddlers, to snowmobiles in the winter season. This segment of the river is also important regionally for the wildlife habitat it provides for grizzly bears and moose. These wildlife species can be seen using the river corridor for travel and foraging among the willow habitat type along the river bottom.

Classification

Recreational: The shoreline of the river segment has some development. There is some evidence of past timber harvest. The river is accessible by the Chief Joseph Scenic Highway (State Highway 296) and the Beartooth Scenic Byway (U S Highway 212), including a bridge crossing.

Dinwoody Creek

Location

The length studied flows northeast from the headwaters to the forest boundary in T37N, R107W, T37N, R106W, T38N, R106W, T39N, R106W and T39N, R105W.

See the map on page 13 of attachment A.

Mileage

Studied: 20 miles

The entire length studied was determined to be eligible.

Flow

The segment is free flowing and free of impoundments.

Outstandingly remarkable values

Dinwoody Creek is important regionally for its significant uncommon scenery as a glacial creek originating from glaciers on the continental divide. The creek is surrounded by the unique landform of steep-faced mountains carved out of granite and limestone by glaciers and glacial streams and numerous active glaciers.

Classification

Wild: The shoreline is primitive and undeveloped. The creek is accessible by the Glacier Trail (801) and inaccessible by roads.

Greybull River

Location

The portion of the river studied flows north from the headwaters below Greybull Pass to one mile before the Jack Creek trailhead in T45N,R104W, T46N,R104W, T46N, R105W, T47N, R105W and T48N, R104W.

See the map on page 6 of attachment A.

Mileage

Studied: 21 miles

The complete length studied was determined to be eligible.

Flow

The river segment is free flowing and free of impoundments.

Outstandingly remarkable values

The Greybull River is important regionally because it contains the most pure strain of the sensitive species Yellowstone cutthroat trout on the Shoshone National Forest. The river is accessed and followed by the popular Greybull River Trail (655) making it important regionally for horseback riding and outfitting, especially during the fall hunting season. This river segment also provides unique paddling opportunities including access to paddling high alpine meadows and access to one of the highest stretches of navigable whitewater in the Northern Rockies from Yellow Creek downstream. There is no development along this segment of the river.

Classification

Wild: The shoreline of the river segment is primitive and has no development. The river is only accessible by the Greybull River Trail (655). There is no evidence of past or ongoing timber harvest.

Middle Popo Agie River

Location

The length of river studied flows north and east from the headwaters to the Middle Fork trailhead in T31N, R102W, T32N, R102W, T32N, R101W. The eligible segment flows east from the Popo Agie Wilderness boundary to the Middle Fork trailhead in T32N, R101W.

See the map on page 8 of attachment A.

Mileage

Studied: 18 miles

The complete length studied was determined to be eligible.

Flow

The river segment is free flowing and free of impoundments.

Outstandingly remarkable values

The Middle Popo Agie River has a high scenic value regionally due to the canyon landscape and the Popo Agie falls that are present in this stretch of river. The Middle Fork Trail (700) runs along the river, making the river important regionally for the recreation opportunities of hiking, camping, and fishing along its shores. Additionally, this segment of river also provides paddlers' access to two excellent class V whitewater sections named the Falls and the Sinks. The Falls section offers a challenging adventure with many portages, while the Sinks section offers a high quality maze of steep and highly technical whitewater.

Classification

Recreational: There are some developments along the shoreline such as campgrounds and trailheads. The stretch of river is easily accessible by forest road 200.3, which fords the river in two locations.

North Fork of the Shoshone River

Location

The length of river studied flows east along U S Highway 14/16/20 (Buffalo Bill Scenic Byway) from the North Absaroka Wilderness boundary to the eastern Forest boundary in T52N, R105W, R106W, R107W and R108W.

See the map on page 4 of attachment A.

Mileage

Studied: 30 miles

The complete length studied was determined to be eligible.

Flow

The river segment is free flowing and free of impoundments.

Outstandingly remarkable values

This segment runs along the Buffalo Bill Scenic Byway, a portal to Yellowstone National Park. The river is important nationally for its unusual Absaroka volcanic geologic formations along the river and the recreational opportunities of picnicking and camping along its shores, fly-fishing, river rafting and paddling, and wildlife viewing. There are many developments along the shore such as campgrounds, picnic areas, and lodges. The river is also very important regionally and nationally as important habitat for the grizzly bear, winter range for bighorn sheep, and the recreational value the habitat provides in allowing visitors to view grizzly bears and sheep along the river. In spring and summer, the vegetation along the river corridor is an important food source for grizzlies. The Shoshone has the largest population of bighorn sheep of any national forest and the area along the lower portion of the river drainage is important winter sheep habitat because it remains open and free of snow. The river corridor is also important nationally for the historic lodges on the Shoshone, including the Buffalo Bill hunting camp at Pahaska Tepee.

Classification

Recreational: There are developments along the shoreline of the river. There is evidence of ongoing timber harvest. The river is accessible by the Buffalo Bill Scenic Byway (U S Highway 14/16/20).

South Fork of the Shoshone River

Location

The portion of river studied flows north from Shoshone Pass approximately 20 miles to the Washakie Wilderness boundary in T45N, R108W, T46N, R108W, T46N, R107W, T47N, R107W and T48N, R106W.

See the map on page 5 of attachment A.

Mileage

Studied: 29 miles

The complete length studied was determined to be eligible.

Flow

The river segment is free flowing and free of impoundments.

Outstandingly remarkable values

The South Fork of the Shoshone River is important regionally because it contains one of just a few Yellowstone cutthroat trout fisheries in Wyoming. This segment of river can be reached by the popular South Fork trail (809.2), which makes it important regionally for recreational activities such as horseback riding, packing, outfitting, and paddling in a remote area. Hiking upstream from the trailhead provides paddlers access to the opportunity to paddle remote box canyons of low to moderate difficulty, which is rare on the Shoshone and regionally. There are no developments along this segment of the river. The river is also very important regionally and nationally for wildlife. Species present in large numbers include the nationally significant grizzly bear, bighorn sheep, and elk. In addition, this river corridor provides critical habitat including winter range, summer range, transition zones, travel corridors, and calving areas.

Classification

Wild: The shoreline of the river segment has no development. The river is accessible only by the South Fork trail (809.2). There is no evidence of timber harvest.

Sunlight Creek

Location

The length studied begins at the Yellowstone National Park boundary and ends at the confluence with the Clarks Fork of the Yellowstone River in T54N, R107W and T56 N, R103W.

Two segments were determined to be eligible.

Segment A of Sunlight Creek flows southwest of State Highway 296 from the North Absaroka Wilderness boundary to the confluence of Spring Creek in T54N, R107W.

Segment B of Sunlight Creek flows northeast of State Highway 296 at Sunlight Bridge in T 55N, R104W, to the confluence of the Clarks Fork of the Yellowstone River in T56 N, R104W.

See maps on pages 1 and 2 of attachment A.

Mileage

Studied: 32.0 miles

Eligible segment A: 8 miles Eligible segment B: 2 miles

Flow

Segment A is free flowing and free of impoundments. There are two to three irrigation diversions on Sunlight Creek below this segment, but they do not affect the natural and riverine appearance of the creek.

Segment B is free flowing and free of impoundments.

Outstandingly remarkable values for Segment A

This segment of the drainage is important regionally as habitat for grizzly bears. High concentrations of grizzly bears use the secure habitat of this upper drainage in the spring when they are moving out of dens and seeking forage along the creek bottom.

Classification for Segment A

Scenic: The shoreline of the river segment is primitive and undeveloped. The creek is accessible by the Forest Road 101 (Sunlight Road) which fords the creek in two locations.

Outstandingly remarkable values for Segment B

This portion of Sunlight Creek is important nationally for its dramatic scenery and Precambrian granitic geology characterized by rugged topography with steep canyon walls approximately 150 feet high. Many visitors enjoy viewing the deep canyon of Sunlight Creek from the Sunlight Bridge, which crosses the creek on the Chief Joseph Scenic Highway (State Highway 296). There is no development along the creek, which is accessible only by foot or horseback. The deep canyon of Sunlight Creek runs into the deep canyon of the nationally designated wild Clarks Fork of the Yellowstone River.

Classification for Segment B

Wild: The shoreline of the river segment is primitive and undeveloped with no evidence of human activity. The creek is accessible only by foot. State Highway 296 runs by the west boundary of the segment.

Warm Spring Creek

Location

The length studied flows north and east from the headwaters to the Forest boundary in T42N, R110W, T42N, R109W, T 42N, R108W, T 41N, R108W and T41N, R107W.

Two segments were determined to be eligible. Segment A flows east from the headwaters to the beginning of Warm Spring Canyon in T42N, R110W, T42N, R109W, T42N, R108W. Segment B runs east from segment A, through the Warm Spring Canyon in T41N, R108W, T42N, R108W, T41N, R107W.

See the maps on pages 9 and 10 of attachment A.

Mileage

Studied: 23 miles

Eligible segment A: 21 miles Eligible segment B: 2 miles

Flow

Both segments are free flowing and free of impoundments.

Outstandingly remarkable values for Segment A

Warm Spring Creek is of regional historic importance due to its use as a travelway for the tie hacking industry that took place in the Warm Spring area from 1927 through 1942, supplying ties to the railroads. Old flumes, splash dams, and tie booms from the tie hacking period can still be viewed along Warm Spring Creek.

Classification for Segment A

Recreational: There is some evidence of past timber harvest. The stretch of the creek is easily accessible by Forest Roads 1B, 544, 532, and 2D. These roads ford the creek in several places.

Outstandingly remarkable values for Segment B

This segment of Warm Spring Creek is important historically for the tie hacking industry that took place in Warm Spring Canyon from 1927 through 1942 to supply the railroads with ties. Old flumes, splash dams, and tie booms from the tie hacking period can still be

viewed in Warm Spring Canyon. This segment of Warm Spring Creek is important regionally for its dramatic scenery as the creek flows abruptly into a narrow canyon with steep granite walls and a natural bridge at its lower end.

Classification for Segment B

Scenic: The shoreline is primitive with no development. The creek is accessible by Forest Road 529 in one location.

West Fork Dunoir Creek

Location

The length studied and eligible segment flow southeast from the headwaters to 1.5 miles before the Forest boundary in T44N, R109W, and T44N, R108W.

See the map on page 11 of attachment A.

Mileage

Studied: 8 miles

The entire length studied was determined to be eligible.

Flow

The segment is free flowing and free of impoundments.

Outstandingly remarkable values

Like Warm Spring Creek, West Dunoir Creek is important historically for the tie hacking industry that took place in the creek from 1921through 1932 to supply the railroads with ties. A splash dam from the tie hacking era still exists on the West Fork of Dunoir Creek. The creek drainage is important regionally for the secure habitat it provides to grizzly bears and wolves on the southern end of the Greater Yellowstone Area.

Classification

Wild: The shoreline is primitive with no development other than the splash dam. The creek is accessible by the Dunoir Trail (808) and inaccessible by roads.

Wiggins Fork

Location

The length of river studied flows southwest from the headwaters to the national forest boundary in T44N, R106W, and T43N, R106W, T45N, R105W and T45N, R106W.

The eligible segment flows south from the Double Cabin trailhead to the national forest boundary in T44N, R106W, and T43N, R106W.

See the map on page 12 of attachment A.

Mileage

Studied: 24 miles

Only a portion, 11 miles, was determined to be eligible.

Flow

The river segment is free flowing and free of impoundments.

Outstandingly remarkable values

Wiggins Fork is important regionally for its impressive canyon scenery of rolling hills leading down to the Wiggins Fork canyon and the Absaroka volcanic geology of the canyon walls.

Classification

Scenic: The shoreline is primitive and undeveloped. The creek is accessible in just a few places by roads.

Wood River

Location

The length of river studied flows northeast 11 miles from the historic mining remains of Kirwin to the national forest boundary in T45N, R104W, T46N, R103W.

See the map on page 7 of attachment A.

Mileage

Studied: 13 miles

The complete length studied was determined to be eligible.

Flow

The river segment is free flowing and free of impoundments.

Outstandingly remarkable values

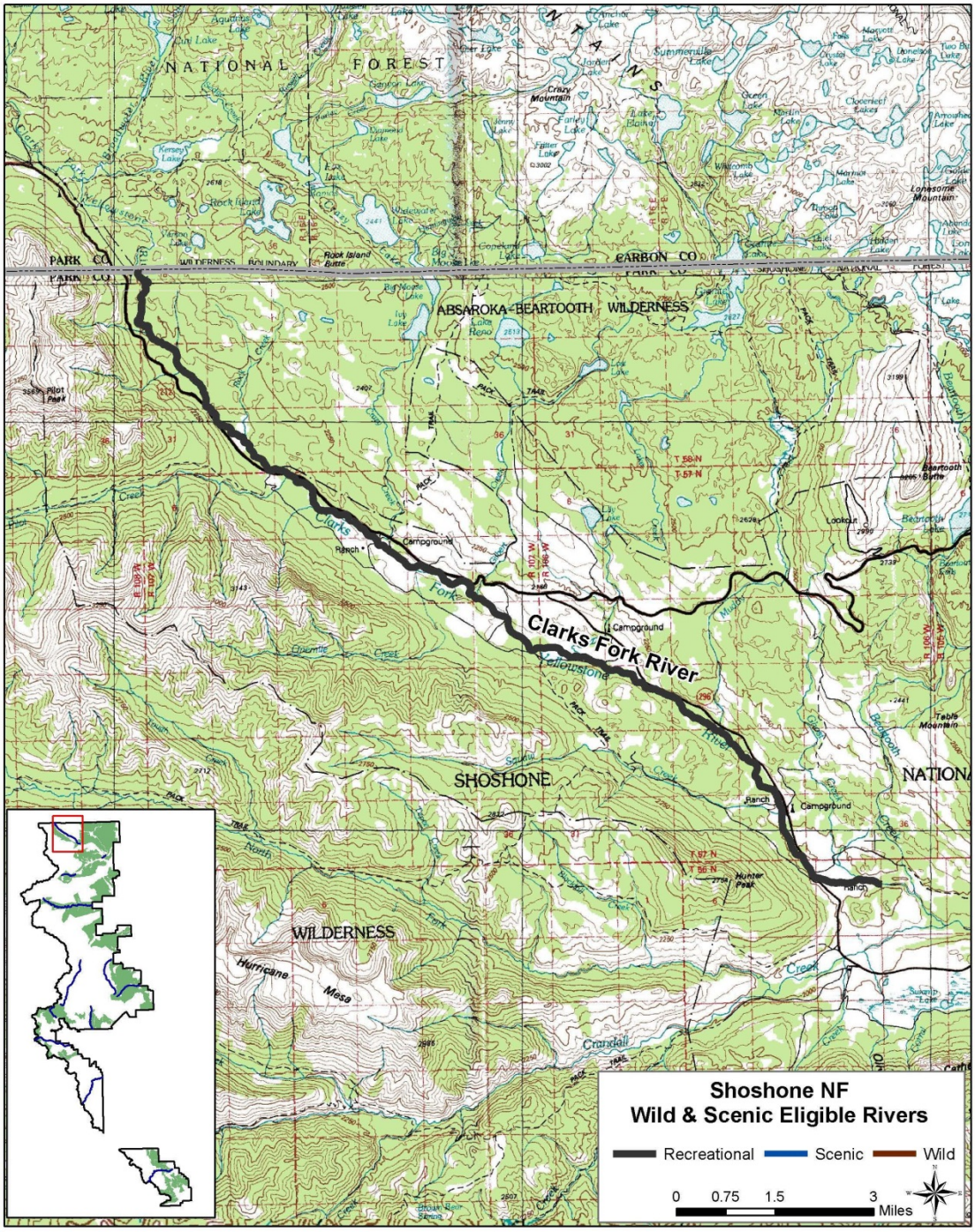
This segment of the Wood River drainage is known regionally for its high mountain scenery and is important recreationally and historically due to its flow through the historic early 1900s mining town of Kirwin. Many visitors conduct scenic drives along this stretch of river and visit the remains of Kirwin and the 1931 Double D ranch. This segment of the Wood River is important regionally because it contains one of the pure strains of Yellowstone cutthroat trout in Wyoming.

Classification

Recreational: There are some developments along the shoreline such as campgrounds and trailheads. The stretch of river is easily accessible by Forest Road 200.3, which fords the river in two locations.

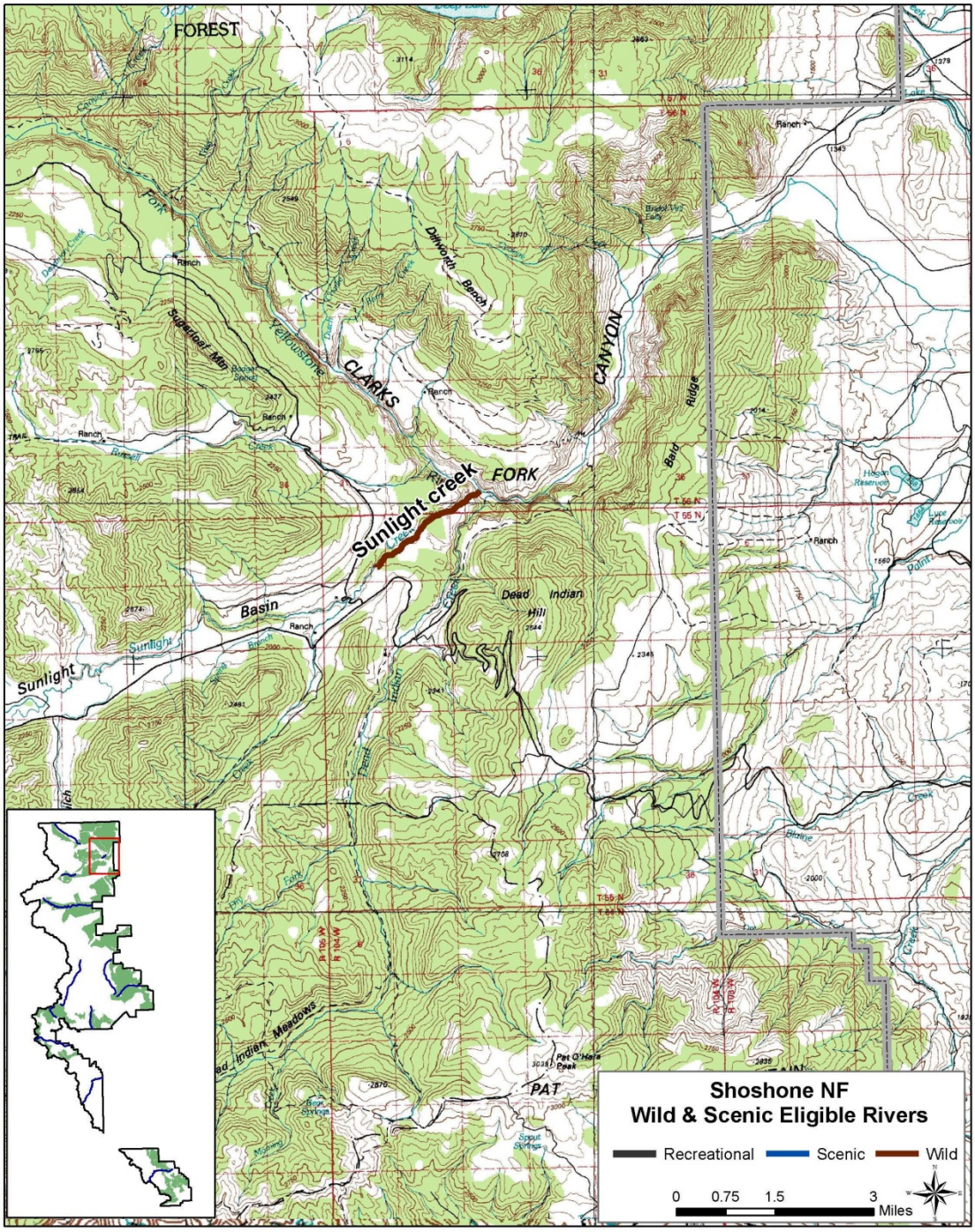
Shoshone National Forest Wild and Scenic Eligible River maps follow.

Wild and Scenic River Evaluation



19

Wild and Scenic River Evaluation



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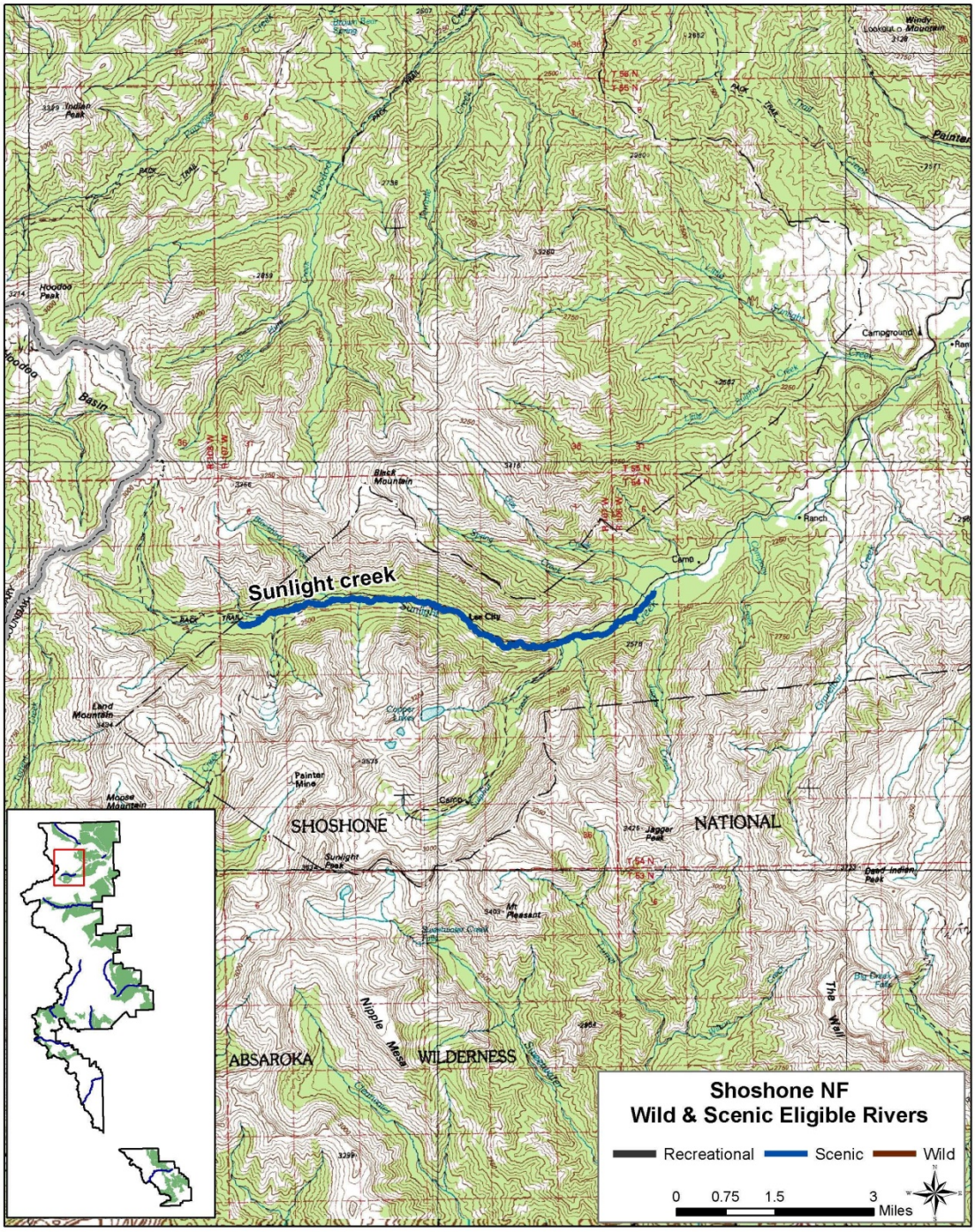
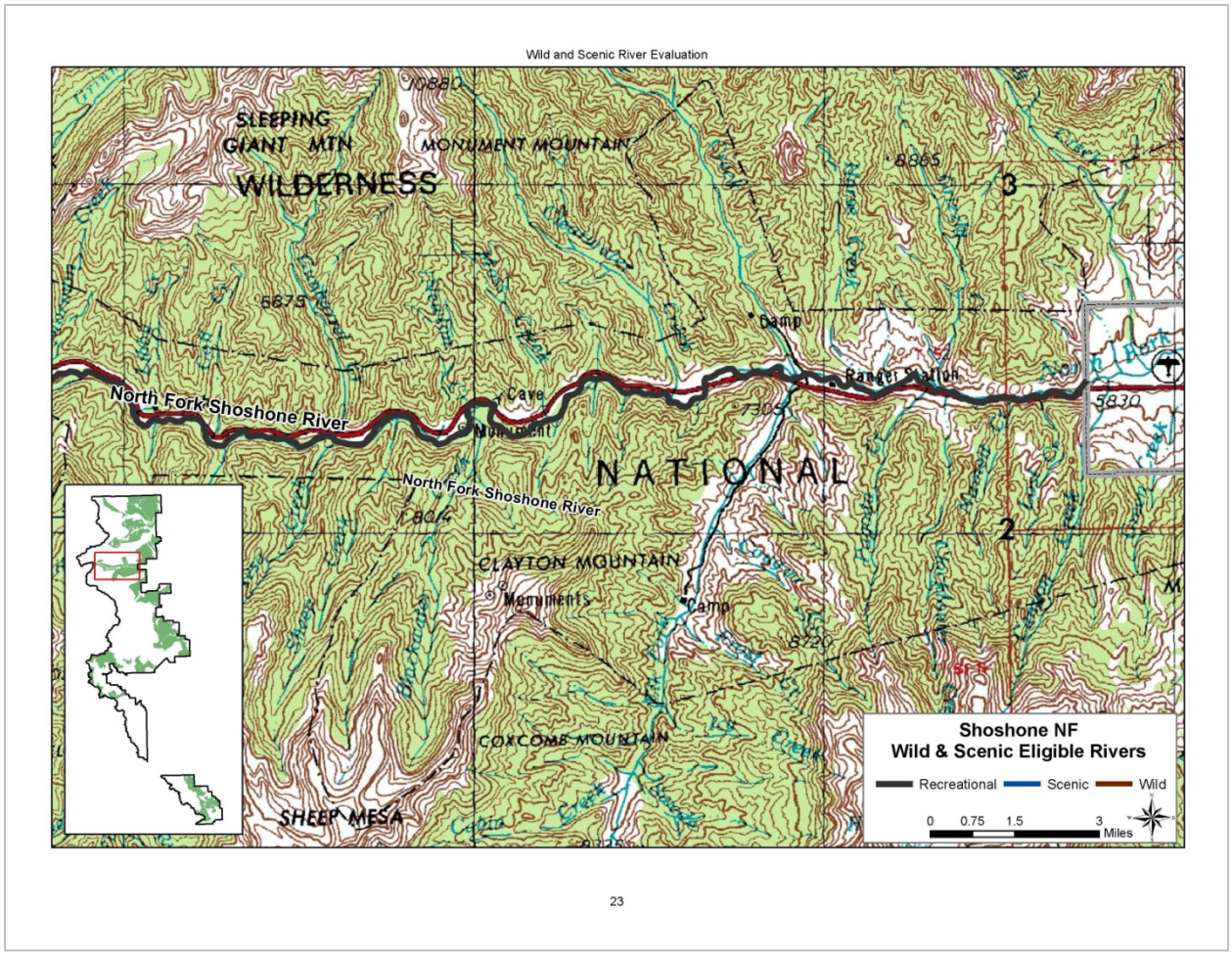
Wild and Scenic River Evaluation



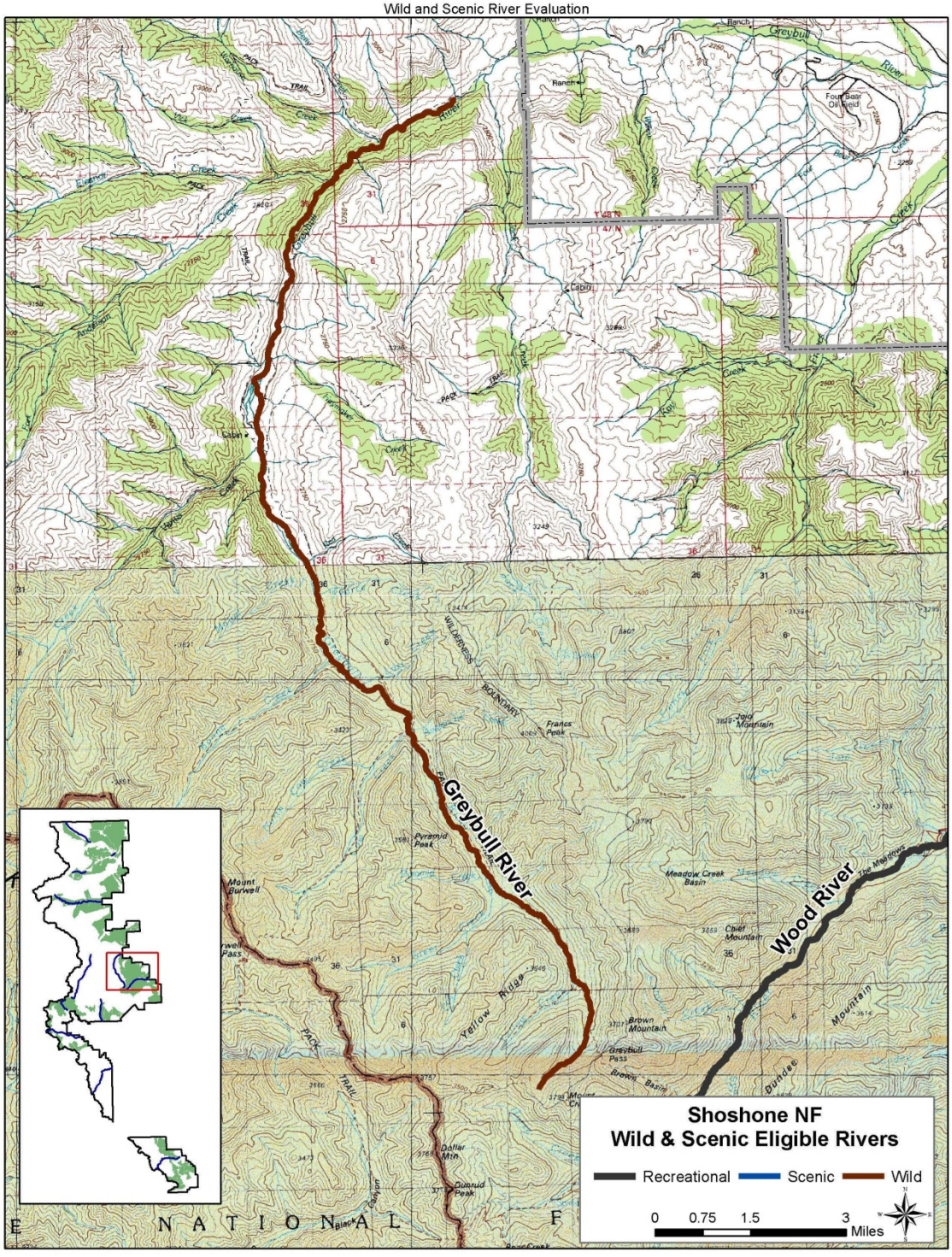
21

Wild and Scenic River Evaluation

22

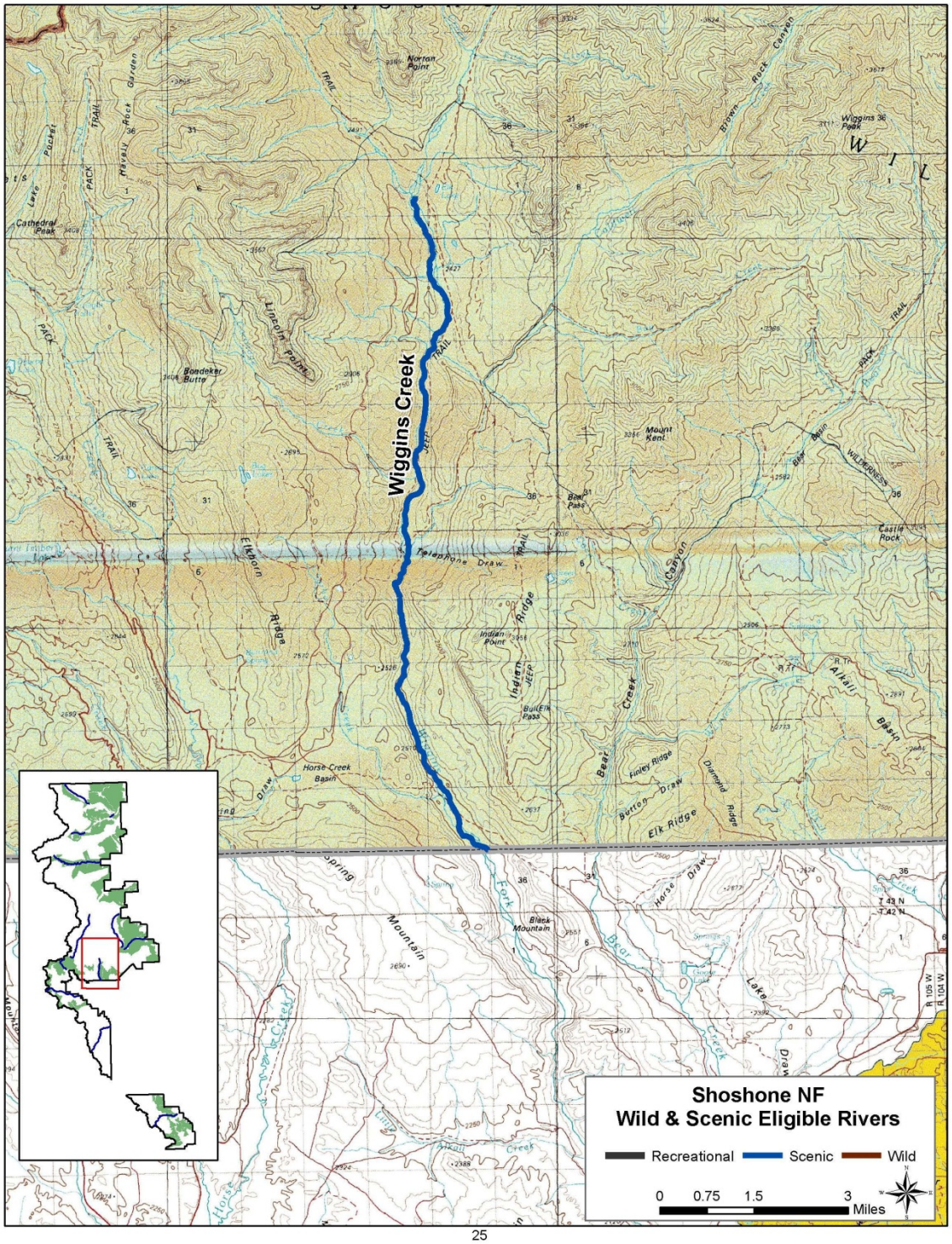

Wild and Scenic River Evaluation
SLEEPING GIANT MTN
WILDERNESS
MONUMENT MOUNTAIN
10880
8865
3
5675
Camp
Ranger Station
5830
North Fork Shoshone River
Cave
Monument
NATIONAL
North Fork Shoshone River
7804
CLAYTON MOUNTAIN
Monuments
Camp
8720
2
COXCOMB MOUNTAIN
SHEEP MESA
Shoshone NF
Wild & Scenic Eligible Rivers
Recreational
Scenic
Wild
0
0.75
1.5
3
Miles
23

Wild and Scenic River Evaluation



24

Wild and Scenic River Evaluation



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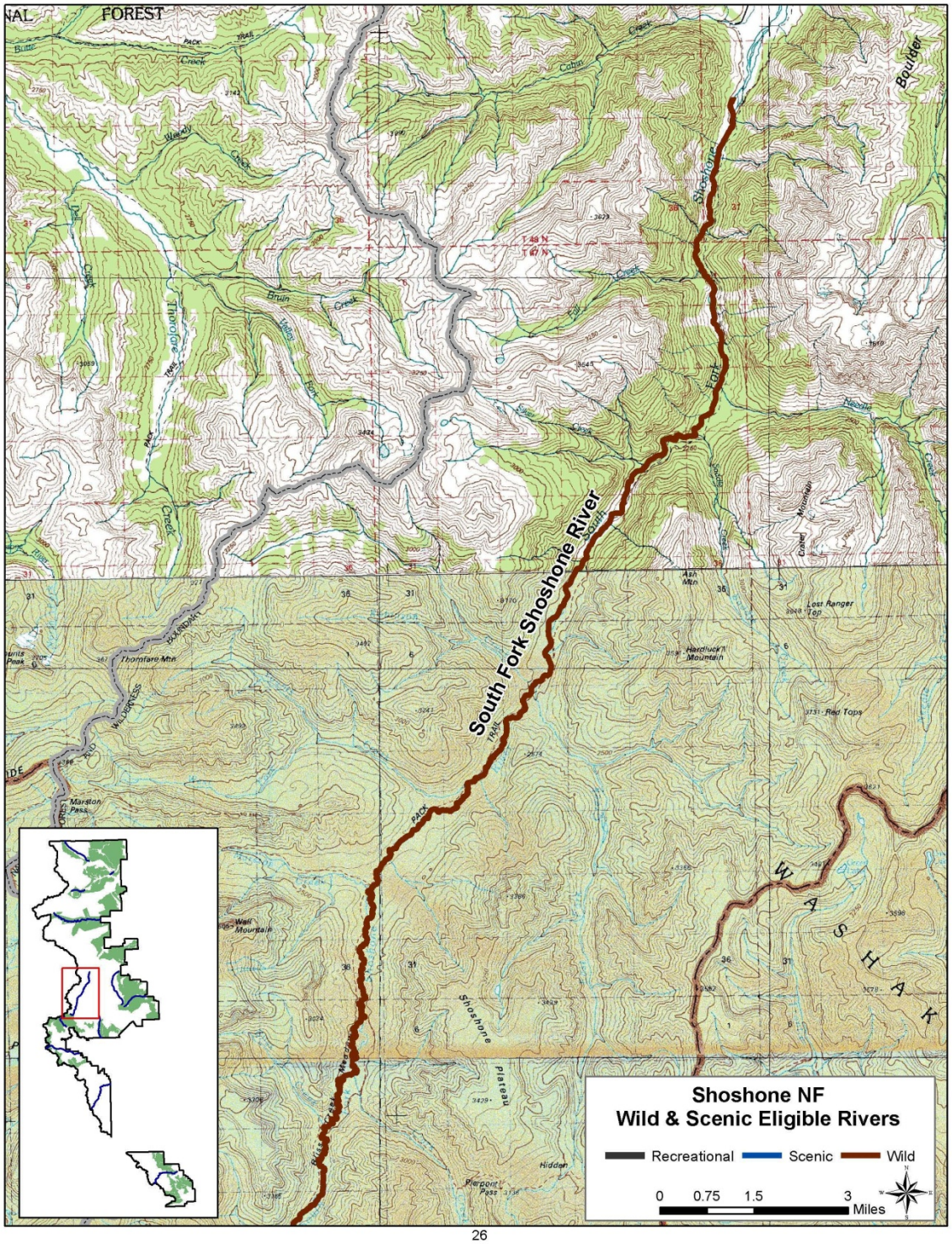
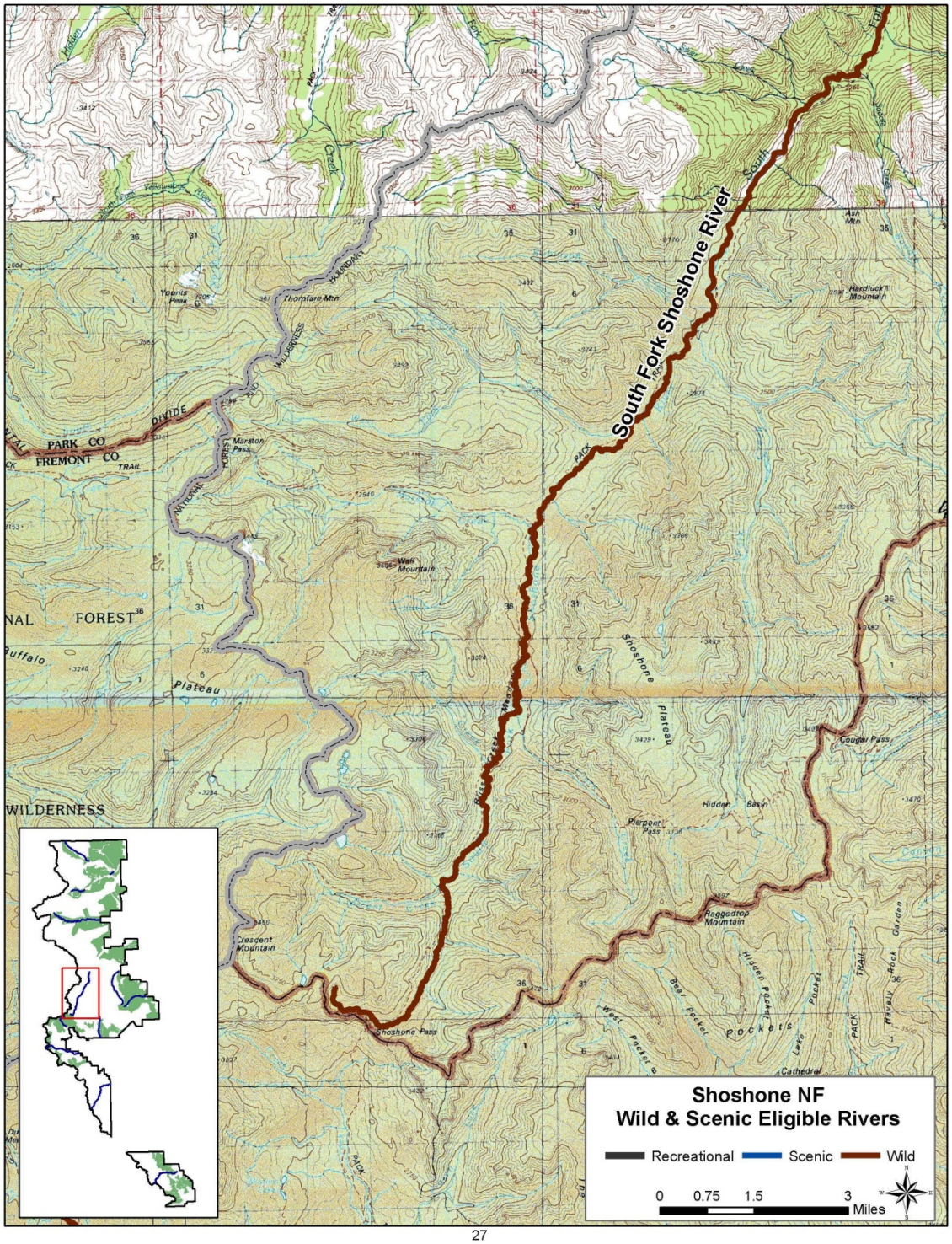
Wild and Scenic River Evaluation



26

Wild and Scenic River Evaluation



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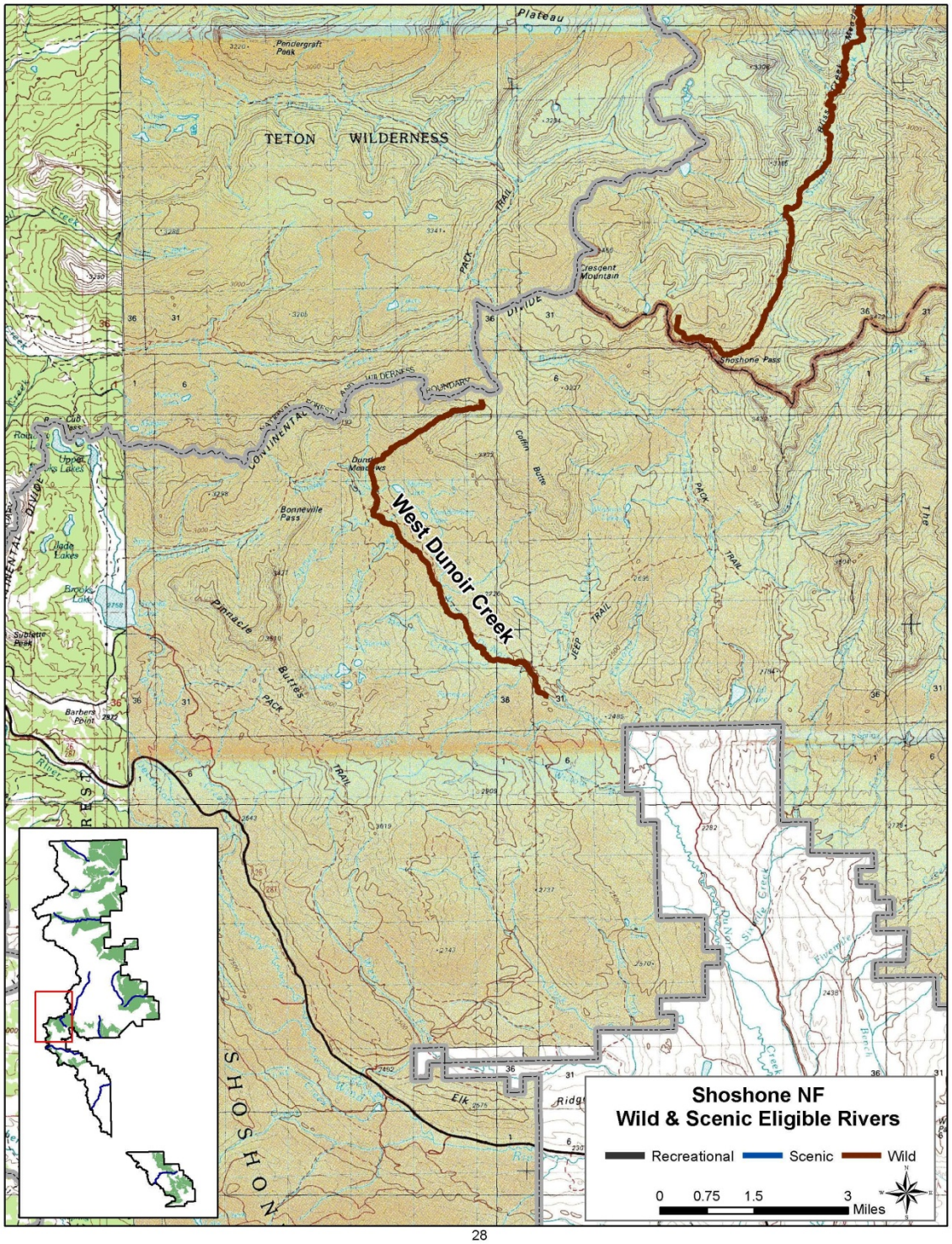
Wild and Scenic River Evaluation



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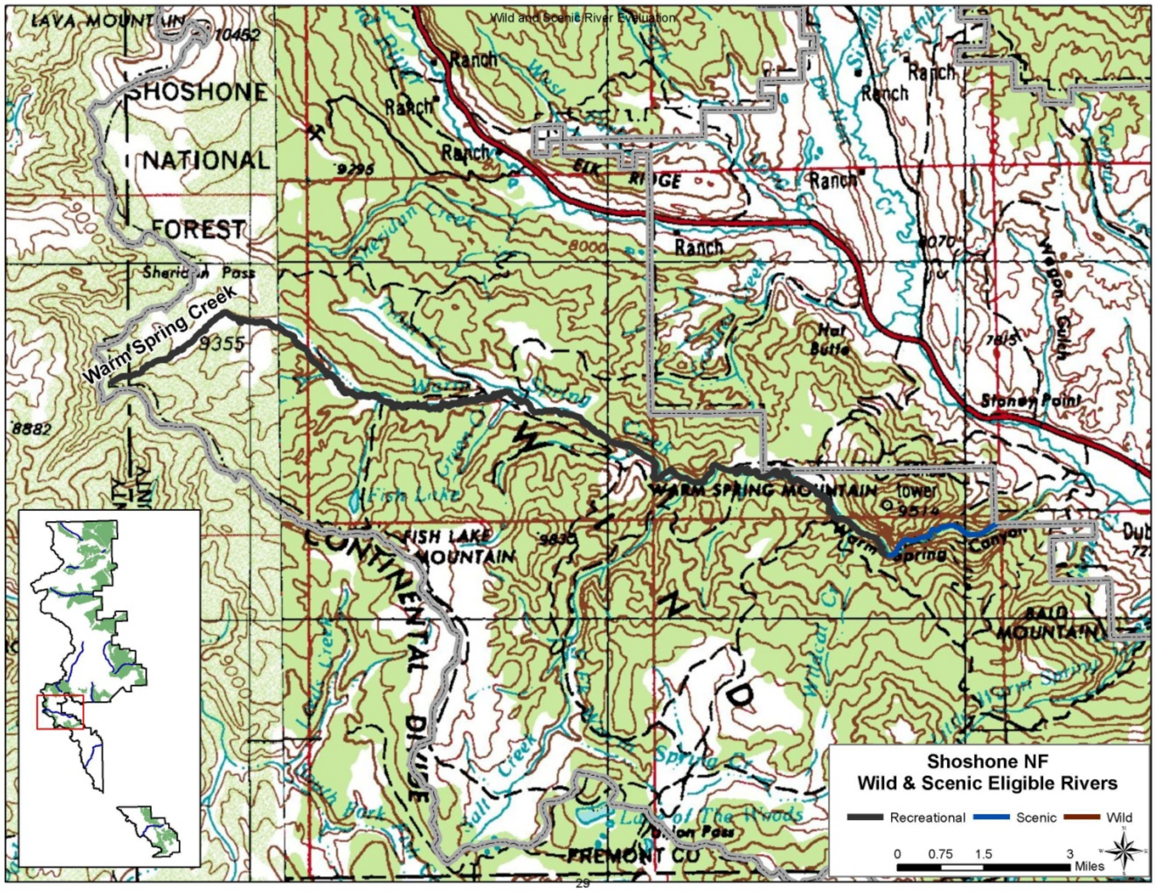
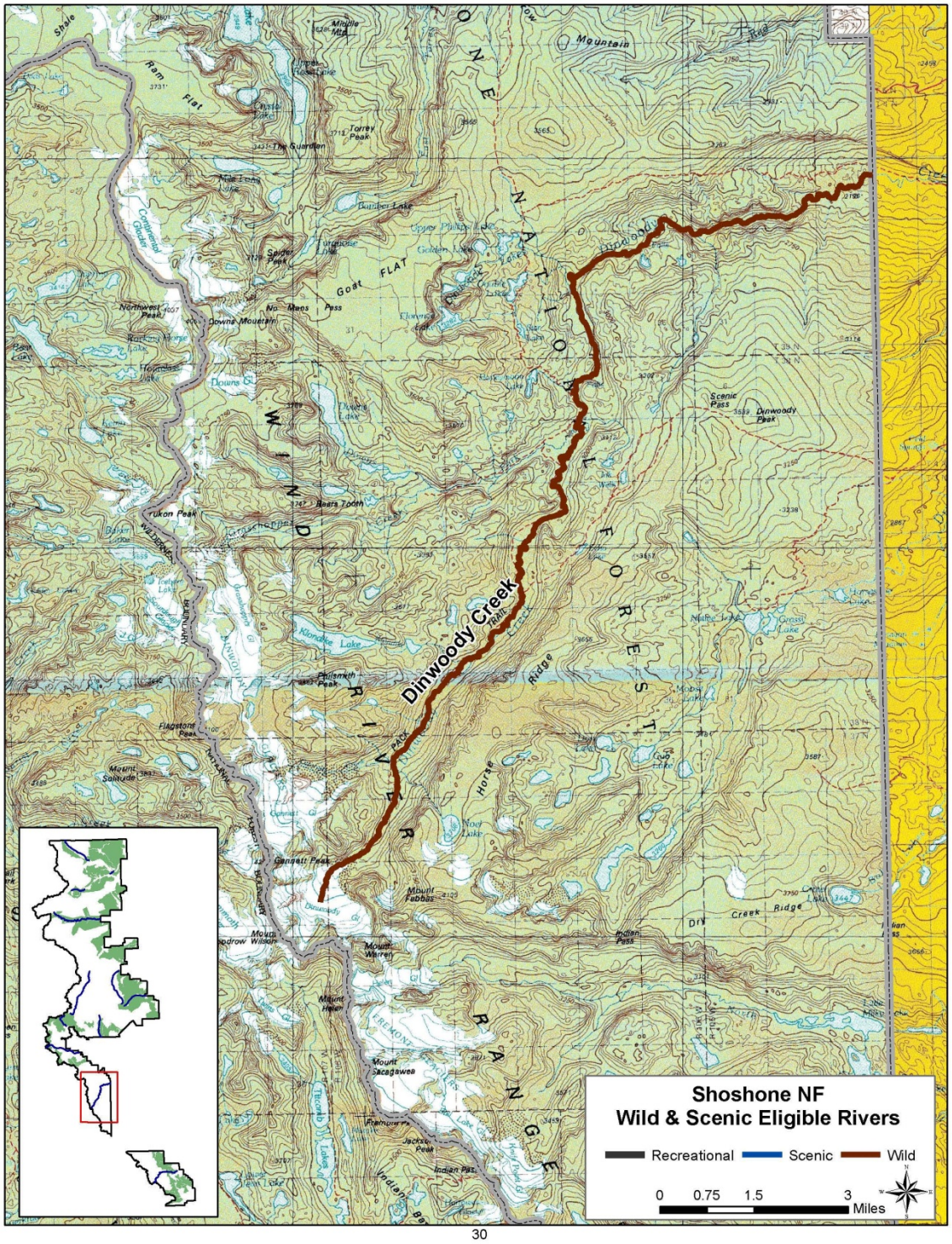

Wild and Scenic River Evaluation
Shoshone NF
Wild & Scenic Eligible Rivers
Recreational
Scenic
Wild
0
0.75
1.5
3
Miles
Warm Spring Creek
LAVA MOUNTAIN
10452
SHOSHONE
NATIONAL
FOREST
Sheridan Pass
9355
8882
9795
ELK RIDGE
Ranch
8000
Hat Butte
Stoney Point
Wagon Gulch
WARM SPRING MOUNTAIN
tower
FISH LAKE MOUNTAIN
CONTINENTAL DIVIDE
BALD MOUNTAIN
Lake of The Woods
FREMONT CO
29

Wild and Scenic River Evaluation



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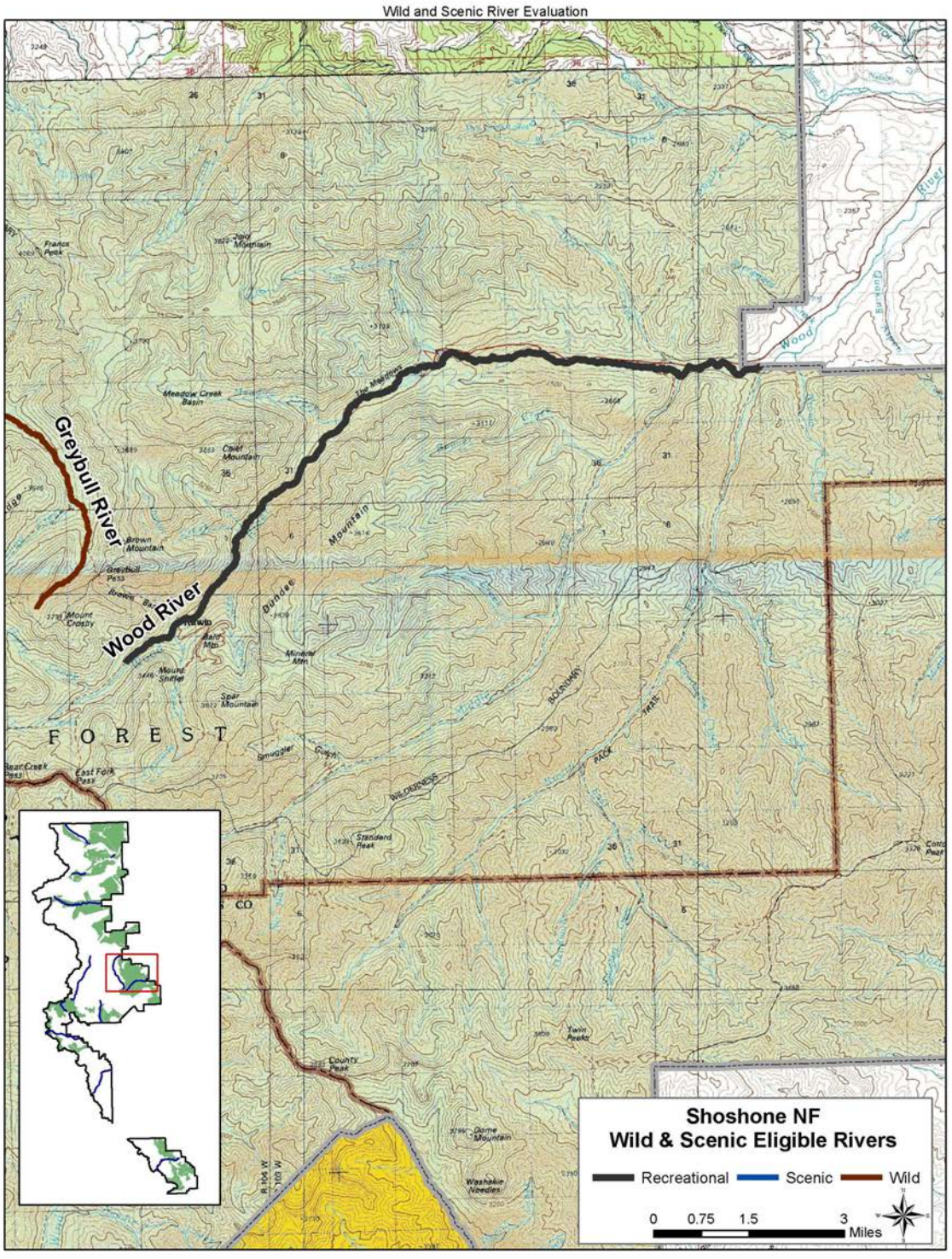
Wild and Scenic River Evaluation

31


Wild and Scenic River Evaluation
Greybull River
Wood River
F O R E S T
Shoshone NF
Wild & Scenic Eligible Rivers
Recreational
Scenic
Wild
0 0.75 1.5 3
Miles

32

Appendix E. Maps

Map #	Map Description
1	Alternative A Management Areas
2	Alternative B Management Areas
3	Alternative C Management Areas
4	Alternative D Management Areas
5	Alternative E Management Areas
6	Alternative F Management Areas
7	Canada Lynx Habitat and Analysis Units
8	Grizzly Bear Primary Conservation Area (PCA)
9	Grizzly Bear Primary Conservation Area, Occupied Habitat and Commercial Livestock Grazing Allotments
10	Grizzly Bear Management Units (BMU)
11	Grizzly Bear Secure Habitat
12	Bighorn Sheep Herd Units
13	Bighorn Sheep Crucial Winter Range
14	Domestic Goat Closure and Core Native Bighorn Sheep Range
15	Elk Calving and Crucial Winter Range
16	Mule Deer Crucial Winter Range
17	Moose Crucial Winter Range
18	Yellowstone Cutthroat Trout Current and Historic Range
19	Fire History 1970 to 2011
20	Wildland-urban Interface
21	Alternatives A, B, D, E, and G Lands Generally Suitable for Livestock Grazing
22	Alternative C Lands Generally Suitable for Livestock Grazing
23	Alternative F Lands Generally Suitable for Livestock Grazing
24	Alternatives A, B, C, D, E, and G Commercial Livestock Grazing Allotments
25	NO MAP

Map #	Map Description
26	Alternative F Commercial Livestock Grazing Allotments
27	Alternative A Suitable Timber Lands
28	Alternatives B and G Suitable Timber Lands
29	Alternative C Suitable Timber Lands
30	Alternative D Suitable Timber Lands
31	Alternative E Suitable Timber Lands
32	Alternative F Suitable Timber Lands
33	Potential for Occurrence of Oil and Gas within Legally Available Lands
34	Oil and Gas Development Potential
35	Alternative A Lands Where Allocation Allows Surface Occupancy for Oil and Gas Development
36	Alternative B Lands Where Allocation Allows Surface Occupancy for Oil and Gas Development
37	Alternative C Lands Where Allocation Allows Surface Occupancy for Oil and Gas Development
38	Alternative D Lands Where Allocation Allows Surface Occupancy for Oil and Gas Development
39	Alternative E Lands Where Allocation Allows Surface Occupancy for Oil and Gas Development
40	Alternative F Lands Where Allocation Allows Surface Occupancy for Oil and Gas Development
41	Continental Divide National Scenic Trail
42	Nez Perce National Historic Trail
43	Scenic Byways
44	Alternative A Lands Where Allocation Allows Summer Motorized Use
45	Alternative B Lands Where Allocation Allows Summer Motorized Use
46	Alternative C Lands Where Allocation Allows Summer Motorized Use
47	Alternative D Lands Where Allocation Allows Summer Motorized Use
48	Alternative E Lands Where Allocation Allows Summer Motorized Use
49	Alternative F Lands Where Allocation Allows Summer Motorized Use
50	Alternative A Lands Where Allocation Allows Winter Motorized Use
51	Alternative B Lands Where Allocation Allows Winter Motorized Use

Map #	Map Description
52	Alternative C Lands Where Allocation Allows Winter Motorized Use
53	Alternative D Lands Where Allocation Allows Winter Motorized Use
54	Alternative E Lands Where Allocation Allows Winter Motorized Use
55	Alternative F Lands Where Allocation Allows Winter Motorized Use
56	Existing and Potentially Eligible Wild and Scenic Rivers
57	Inventoried Roadless Areas
58	Research Natural Areas and Special interest Areas
59	Alternative A Visual Quality Objectives
60	Alternative B Scenery Integrity Objective
61	Alternative C Scenery Integrity Objective
62	Alternative D Scenery Integrity Objective
63	Alternative E Scenery Integrity Objective
64	Alternative F Scenery Integrity Objective
65	Municipal Watersheds
66	Streams
67	Riparian and Wetlands
68	Fire Hazard Rating
69	Alternatives A, B, E, F, and G Wilderness Settings
70	Alternative C Wilderness Settings
71	Alternative D Wilderness Settings
72	Alternative B Crucial Winter Range and Snowmobile Exemptions Area
73	Alternative G Crucial Winter Range and Snowmobile Exemptions Area
74	Snowmobile Trails and Big Game Crucial Winter Range
75	Alternative G Lands Where Allocation Allows Occupancy For Oil and Gas Development
76	Alternative G Lands Where Allocation Allows Summer Motorized Use
77	Alternative G Lands Where Allocation Allows Winter Mortorized Use
78	Alternative G Scenic Integrity Objectives
79	Alternative G Management Areas
80	Current Oil and Gas Leases

Appendix F - Commercial Livestock Allotment Capable and Suitable Acres and AUMs by Allotment

Allotment Name	Total Acres	Capable Acres	% Capable	Alts A/B/D/G Suitable Acres	Alts A/B/D/G Pct Suitable	Alts A/B/D/G AUMs	Alts A/B/D/G Acres per AUM	Alts C Suitable Acres	Alt C Pct Suitable	Alt C AUMs	Alt C Acres per AUM
Aspen	2,099	1,807	86%	449	21%	201	2.2	439	21%	197	2.2
Atlantic City	968	968	100%	857	89%	48	17.8	857	89%	48	17.8
Bald Ridge	24,609	20,825	85%	8,526	35%	2,644	3.2	2,696	11%	836	3.2
Basin	69,275	56,622	82%	18,583	27%	1,422	13.1	4,505	7%	345	13.1
Bayer Mountain	5,626	5,056	90%	1,525	27%	190	8.0	1,483	26%	185	8.0
Bear Creek	34,909	32,667	94%	14,303	41%	2,475	5.8	9,843	28%	1703	5.8
Beartooth and	30,327	26,143	86%	19,034	63%	1,366	18.9	17,063	56%	1239	18.9
Face of the Mountain	8,280	7,783	94%	6,843	83%			6,402	77%		
Beaver Creek	1,031	1,030	100%	666	65%	99	6.7	666	65%	99	6.7
Belknap	10,885	9,088	83%	2,597	22%	941	2.8	1,366	13%	495	2.8
Bench	28,414	18,253	64%	10,491	37%	1,197	8.8	5,932	21%	677	8.8
Big Creek	18,730	11,519	62%	4,770	25%	85	56.1	11	0%	0	56.1
Bobcat	6,515	4,981	76%	2,285	35%	133	17.2	0	0%	0	0.0
Bull Creek	402	379	94%	100	25%	33	3.0	0	0%	0	0.0
Carter Creek	164	149	91%	21	13%	20	1.0	18	11%	18	1.0
Community	14,993	10,497	70%	6,660	44%	523	12.7	53	0%	4	12.7
Cottonwood	6,687	5,726	86%	1,129	17%	195	5.8	1,129	17%	195	5.8
Crandall and	17,478	15,396	88%	4,763	27%	1,134	6.4	1,384	8%	559	6.4
Reef Creek	11,244	9,648	86%	2,500	22%			2,196	20%		
Deer Creek	4,416	3,363	76%	1,126	26%	186	6.1	1,126	26%	186	6.1
Dick Creek	10,622	9,208	87%	3,571	34%	1,328	2.7	2,322	22%	864	2.7
Dickinson Park	22,140	19,471	88%	4,847	22%	896	5.4	4,847	22%	896	5.4
Doby Cliff	801	782	98%	568	71%	132	4.3	568	71%	132	4.3
Dunoir	53,245	46,820	88%	15,740	30%	1,406	11.2	11,495	22%	1027	11.2
Ed Young Basin	11,341	10,804	95%	5,701	50%	906	6.3	5,215	46%	829	6.3
Fish Lake	12,746	12,520	98%	3,397	27%	1,098	3.1	3,397	27%	1098	3.1
Frye Lake	21,699	20,878	96%	4,821	22%	498	9.7	4,596	21%	475	9.7
Ghost Creek	10,744	10,425	97%	5,705	53%	1,827	3.1	2,153	20%	689	3.1
Gooseberry	10,730	9,682	90%	1,549	14%	301	5.1	1,413	13%	275	5.1
Greybull	34,619	30,029	87%	20,912	60%	1,203	17.4	5,004	14%	288	17.4
Guard Station	13,230	9,227	70%	1,847	14%	442	4.2	1,697	13%	406	4.2
Hardpan	15,219	13,361	88%	5,211	34%	1,883	2.8	0	0%	0	0.0
Hays Park	8,670	8,299	96%	4,777	55%	541	8.8	4,751	55%	538	8.8
Horse Creek	28,240	21,231	75%	8,033	28%	521	15.4	3,601	13%	234	15.4
Hunter Creek	1,596	1,110	70%	748	47%	143	5.2	18	1%	3	5.2
Ishawooa Hills	1,129	1,018	90%	890	79%	400	2.2	0	0%	0	0.0
Kirwin and	17,589	9,341	53%	3,946	22%	303	17.6	3,147	18%	258	17.6
Wood River	4,050	3,149	78%	1,396	34%			1,396	34%		
Lake Creek	18,873	17,853	95%	7,000	37%	1,819	3.8	4,977	26%	1293	3.8
Little Rock	4,902	4,083	83%	3,210	65%	260	12.3	1,390	28%	113	12.3
Maxon Basin	3,794	3,750	99%	1,509	40%	348	4.3	1,509	40%	348	4.3
Meadow Creek	1,351	1,329	98%	1,151	85%	81	14.2	1,151	85%	81	14.2
Meeteetse	5,822	5,370	92%	3,247	56%	260	12.5	817	14%	65	12.5
Middle Fork	26,469	25,475	96%	9,545	36%	903	10.6	9,479	36%	897	10.6

Allotment Name	Total Acres	Capable Acres	% Capable	Alts A/B/D/G Suitable Acres	Alts A/B/D/G Pct Suitable	Alts A/B/D/G AUMs	Alts A/B/D/G Acres per AUM	Alts C Suitable Acres	Alt C Pct Suitable	Alt C AUMs	Alt C Acres per AUM
North Fork Winter Range	4,528	3,563	79%	2,073	46%	300	6.9	0	0%	0	0.0
Parque Creek	13,426	11,624	87%	3,613	27%	568	6.4	2,257	17%	355	6.4
Pickett Creek	14,275	12,148	85%	7,030	46%	1,569	4.5	168	1%	37	4.5
Pine Willow S&G	18,301	17,950	98%	9,753	53%	208	46.9	9,753	53%	208	46.9
Piney	13,730	10,561	77%	6,935	51%	566	12.3	420	3%	34	12.3
Ramshorn	16,212	14,293	88%	4,158	26%	613	6.8	3,329	21%	491	6.8
Rand Creek	1,584	1,353	85%	391	25%	158	2.5	0	0%	0	0.0
Rennerberg	1,349	996	74%	309	23%	87	3.6	309	23%	87	3.6
Robbers Roost	50,642	44,426	88%	22,623	45%	3,893	5.8	1,314	3%	226	5.8
Rock Creek	16,832	12,355	73%	4,517	27%	1,648	2.7	639	4%	233	2.7
Sage Creek	922	655	71%	430	47%	69	6.2	0	0%	0	0.0
Salt Creek	8,264	8,224	100%	5,489	66%	2,162	2.5	5,489	66%	2162	2.5
Sawmill	9,392	8,959	95%	4,028	43%	716	5.6	2,690	29%	478	5.6
Slate Creek S&G	8,695	8,685	100%	6,027	69%	200	30.1	6,027	69%	200	30.1
South Pass	4,833	4,827	100%	2,705	56%	120	22.5	2,705	56%	120	22.5
Squaw Creek	6,302	6,115	97%	2,018	32%	190	10.6	2,018	32%	190	10.6
Sugarloaf & East Fork	19,985	16,140	81%	4,408	22%	607	7.3	4,408	22%	607	7.3
Table Mountain	13,794	11,381	83%	3,370	24%	2,006	1.7	1,834	13%	1092	1.7
Timber Creek	10,009	7,178	72%	2,329	23%	507	4.6	1,522	15%	331	4.6
Union Pass	39,777	38,304	96%	14,133	36%	2,672	5.3	12,344	31%	2334	5.3
Valley Boulder	3,376	2,181	65%	1,504	45%	138	10.9	2	0%	0	10.9
Warm Springs and	16,877	16,815	100%	5,183	31%	3,194	6.4	5,183	31%	3010	6.4
Wind River	45,297	42,256	93%	15,205	34%			14,033	31%		
Washakie Needles	7,753	3,627	47%	3,627	47%	542	6.7	2,123	27%	317	6.7
Whiskey Mountain	12,423	10,993	88%	5,003	40%	133	37.6	402	3%	11	37.6
Wiggins Fork	44,550	39,030	88%	11,955	27%	2,673	4.5	5,768	13%	1290	4.5
Atlantic	19,511	14,372	74%								
Bear Cr. Addition	264	179	68%								
Burnt Mountain	4,190	2,493	60%								
Citadel	13,050	3,462	27%								
Deep Lake	6,522	1,900	29%								
Fox Creek	3,978	1,198	30%								
Francs Peak	14,100	1,185	8%								
Hunter Cr. West	532	354	67%								
Jack Creek	1,847	862	47%								
Lodgepole	7,264	4,283	59%								
Louis Lake	3,054	2,487	81%								
Middle Wood	12,925	1,714	13%								
North Fork	75,201	31,914	42%								
One Mile	7,787	1,951	25%								
Peat Beds	5,826	3,970	68%								
Shoshone Lake	6,795	5,502	81%								
South Fork	2,295	1,737	76%								
Sunlight	24,822	5,563	22%								
Torrey Creek	736	417	57%								
Twinn Peaks	4,702	1,239	26%								
West Beartooth	28,452	12,954	46%								
Yellow/Steer Creek	19,164	1,258	7%								
Totals and Averages	1,302,815	992,751	76%	375,368	40%	55,930	9.7	216,847	24%	31,406	9.1

Allotment Name	Total Acres	Capable Acres	% Capable	Alt E Suitable Acres	Alt E Pct Suitable	Alt E AUMs	Alt E Acres per AUM	Alt F Suitable Acres	Alt F Pct Suitable	Alt F AUMs	Alt F Acres per AUM
Aspen	2,099	1,807	86%	449	21%	201	2.2	449	21%	201	2.2
Atlantic City	968	968	100%	857	89%	48	17.8	857	89%	48	17.8
Bald Ridge	24,609	20,825	85%	8,526	35%	2,825	3.0	8,526	35%	2,825	3.0
Basin	69,275	56,622	82%	18,583	27%	1,530	12.1	18,583	27%	1,530	12.1
Bayer Mountain	5,626	5,056	90%	1,525	27%	191	8.0	1,525	27%	191	8.0
Bear Creek	34,909	32,667	94%	14,303	41%	2,552	5.6	14,303	41%	2,552	5.6
Beartooth and	30,327	26,143	86%	19,034	63%	1,379	18.8	19,034	63%	1,379	18.8
Face of the Mountain	8,280	7,783	94%	6,843	83%			6,843	83%		
Beaver Creek	1,031	1,030	100%	666	65%	99	6.7	666	65%	99	6.7
Belknap	10,885	9,088	83%	2,597	22%	986	2.6	2,597	22%	986	2.6
Bench	28,414	18,253	64%	10,491	37%	1,249	8.4	10,491	37%	1,249	8.4
Big Creek	18,730	11,519	62%	4,770	25%	93	51.0	4,770	25%	93	51.0
Bobcat	6,515	4,981	76%	2,285	35%	146	15.6	2,285	35%	146	15.6
Bull Creek	402	379	94%	100	25%	36	2.8	100	25%	36	2.8
Carter Creek	164	149	91%	21	13%	20	1.0	21	13%	20	1.0
Community	14,993	10,497	70%	6,660	44%	575	11.6	6,660	44%	575	11.6
Cottonwood	6,687	5,726	86%	1,129	17%	195	5.8	1,129	17%	195	5.8
Crandall and	17,478	15,396	88%	4,763	27%	1,192	6.1	4,763	27%	1,192	6.1
Reef Creek	11,244	9,648	86%	2,500	22%			2,500	22%		
Deer Creek	4,416	3,363	76%	1,126	26%	186	6.1	1,126	26%	186	6.1
Dick Creek	10,622	9,208	87%	3,571	34%	1,374	2.6	3,571	34%	1,374	2.6
Dickinson Park	22,140	19,471	88%	4,847	22%	896	5.4	4,847	22%	896	5.4
Doby Cliff	801	782	98%	568	71%	132	4.3	568	71%	132	4.3
Dunoir	53,245	46,820	88%	15,740	30%	1,444	10.9	15,740	30%	1,444	10.9
Ed Young Basin	11,341	10,804	95%	5,701	50%	914	6.2	5,701	50%	914	6.2
Fish Lake	12,746	12,520	98%	3,397	27%	1,098	3.1	3,397	27%	1,098	3.1
Frye Lake	21,699	20,878	96%	4,821	22%	500	9.6	4,821	22%	500	9.6
Ghost Creek	10,744	10,425	97%	5,705	53%	1,941	2.9	5,705	53%	1,941	2.9
Gooseberry	10,730	9,682	90%	1,549	14%	304	5.1	1,549	14%	304	5.1
Greybull	34,619	30,029	87%	20,912	60%	1,295	16.2	20,912	60%	1,295	16.2
Guard Station	13,230	9,227	70%	1,847	14%	446	4.1	1,847	14%	446	4.1
Hardpan	15,219	13,361	88%	5,211	34%	2,071	2.5	5,211	34%	2,071	2.6
Hays Park	8,670	8,299	96%	4,777	55%	541	8.8	4,777	55%	541	8.8
Horse Creek	28,240	21,231	75%	8,033	28%	550	14.6	8,033	28%	550	14.6
Hunter Creek	1,596	1,110	70%	748	47%	157	4.8	748	47%	157	4.8
Ishawooa Hills	1,129	1,018	90%	890	79%	440	2.0	890	79%	440	2.0
Kirwin and	17,589	9,341	53%	3,946	22%	308	17.4	3,946	22%	308	17.4
Wood River	4,050	3,149	78%	1,396	34%			1,396	34%		
Lake Creek	18,873	17,853	95%	7,000	37%	1,872	3.7	7,000	37%	1,872	3.7
Little Rock	4,902	4,083	83%	3,210	65%	275	11.7	3,210	65%	275	11.7
Maxon Basin	3,794	3,750	99%	1,509	40%	348	4.3	1,509	40%	348	4.3
Meadow Creek	1,351	1,329	98%	1,151	85%	81	14.2	1,151	85%	81	14.2
Meeteetse	5,822	5,370	92%	3,247	56%	279	11.6	3,247	56%	279	11.6
Middle Fork	26,469	25,475	96%	9,545	36%	904	10.6	9,545	36%	904	10.6
North Fork Winter Range	4,528	3,563	79%	2,073	46%	330	6.3	2,073	46%	330	6.3
Parque Creek	13,426	11,624	87%	3,613	27%	589	6.1	3,613	27%	589	6.1
Pickett Creek	14,275	12,148	85%	7,030	46%	1,722	4.1	7,030	46%	1,722	3.8
Pine Willow S&G	18,301	17,950	98%	9,753	53%	208	46.9	9,753	53%	208	46.9
Piney	13,730	10,561	77%	6,935	51%	619	11.2	6,935	51%	619	11.2
Ramshorn	16,212	14,293	88%	4,158	26%	625	6.7	4,158	26%	625	6.7
Rand Creek	1,584	1,353	85%	391	25%	174	2.3	391	25%	174	2.3
Rennerberg	1,349	996	74%	309	23%	87	3.6	309	23%	87	3.6
Robbers Roost	50,642	44,426	88%	22,623	45%	4,260	5.3	22,623	45%	4,260	5.3

Allotment Name	Total Acres	Capable Acres	% Capable	Alt E Suitable Acres	Alt E Pct Suitable	Alt E AUMs	Alt E Acres per AUM	Alt F Suitable Acres	Alt F Pct Suitable	Alt F AUMs	Alt F Acres per AUM
Rock Creek	16,832	12,355	73%	4,517	27%	1,789	2.5	4,517	27%	1,789	2.5
Sage Creek	922	655	71%	430	47%	76	5.7	430	47%	76	5.7
Salt Creek	8,264	8,224	100%	5,489	66%	2,162	2.5	5,489	66%	2,162	2.5
Sawmill	9,392	8,959	95%	4,028	43%	740	5.4	4,028	43%	740	5.4
Slate Creek S&G	8,695	8,685	100%	6,027	69%	200	30.1	6,027	69%	200	30.1
South Pass	4,833	4,827	100%	2,705	56%	120	22.5	2,705	56%	120	22.5
Squaw Creek	6,302	6,115	97%	2,018	32%	190	10.6	2,018	32%	190	10.6
Sugarloaf & East Fork	19,985	16,140	81%	4,408	22%	607	7.3	4,408	22%	607	7.3
Table Mountain	13,794	11,381	83%	3,370	24%	2,097	1.6	3,370	24%	2,097	1.6
Timber Creek	10,009	7,178	72%	2,329	23%	525	4.4	2,329	23%	525	4.4
Union Pass	39,777	38,304	96%	14,133	36%	2,706	5.2	14,133	36%	2,706	5.2
Valley Boulder	3,376	2,181	65%	1,504	45%	152	9.9	1,504	45%	152	9.9
Warm Springs and	16,877	16,815	100%	5,183	31%	3,212	6.3	5,183	31%	3,212	6.3
Wind River	45,297	42,256	93%	15,205	34%			15,205	34%		
Washakie Needles	7,753	3,627	47%	3,627	47%	564	6.4	3,627	47%	564	6.4
Whiskey Mountain	12,423	10,993	88%	5,003	40%	145	34.4	5,003	40%	145	34.4
Wiggins Fork	44,550	39,030	88%	11,955	27%	2,811	4.3	11,955	27%	2,811	4.3
Atlantic	19,511	14,372	74%					5,740	29%	320	17.9
Bear Cr. Addition	264	179	68%					10	4%	2	5.0
Burnt Mountain	4,190	2,493	60%					1,096	26%	130	8.4
Citadel	13,050	3,462	27%					574	4%	120	4.8
Deep Lake	6,522	1,900	29%					359	6%	42	8.5
Fox Creek	3,978	1,198	30%					147	4%	39	3.8
Francs Peak	14,100	1,185	8%					241	2%	31	7.8
Hunter Cr. West	532	354	67%					327	61%	63	5.2
Jack Creek	1,847	862	47%					824	45%	110	7.5
Lodgepole	7,264	4,283	59%					1,186	16%	44	27.0
Louis Lake	3,054	2,487	81%					446	15%	100	4.5
Middle Wood	12,925	1,714	13%					511	4%	160	3.2
North Fork	75,201	31,914	42%					14,730	20%	550	26.8
One Mile	7,787	1,951	25%					421	5%	16	26.3
Peat Beds	5,826	3,970	68%					1,485	25%	180	8.2
Shoshone Lake	6,795	5,502	81%					2,087	31%	200	10.4
South Fork	2,295	1,737	76%					1,662	72%	150	11.1
Sunlight	24,822	5,563	22%					937	4%	71	13.2
Torrey Creek	736	417	57%					193	26%	18	10.7
Twinn Peaks	4,702	1,239	26%					90	2%	10	9.0
West Beartooth	28,452	12,954	46%					6,384	22%	740	8.6
Yellow/Steer Creek	19,164	1,258	7%					552	3%	72	7.7
Totals and Averages	1,302,815	992,751	76%	375,368	40%	58,382	9.3	415,370	35%	61,549	9.6

Appendix G. Detail Information for Watersheds Functioning at Risk

The Watershed Condition Framework is a comprehensive national approach for classifying watershed condition. This is an interdisciplinary process that ranks watersheds according to three watershed condition classes directly related to the degree or level of watershed functionality or integrity. The classes are Class 1, 2, and 3, which equate to Functioning Properly (Good), Functioning at Risk (Fair), and Impaired Function (Poor). Ranking is based on four categories that represent terrestrial, riparian, and aquatic ecosystem processes or mechanisms by which management actions can affect the condition of watersheds and associated resources. This framework has been implemented across the Greater Yellowstone Area, including those units that are not Forest Service, in an effort to consistently manage at the ecosystem level. Data from this analysis can be accessed at http://www.fs.fed.us/publications/watershed/.

The following information is detailed assessment information from the Watershed Condition Framework for the 16 watersheds on the Shoshone that fall in Class 2,"Functioning at Risk." The indicators for the watersheds that are not in the properly functioning range are listed.

Watershed name	Clarks Fork Yellowstone River –Squaw Creek	**code**	100700060106
Total watershed acres:	22,730	**Acres on Forest**:	21,800
Indicators:			
Water quality	ANC ≤ 20 per Gallatin Forest air quality data analysis. Sediment loading in Ghost and Muddy Creeks (upward trend).		
Aquatic habitat – fragmentation (% of stream miles)	>25%		
Aquatic habitat – survey	Squaw Creek impacts for 1988 wildfire		
Aquatic biota – native vs. non-native species	Non-native replaced native		
Road – maintenance	Past due		
Road – proximity to stream (% road within 300 feet of stream)	10–25%		
Roads – on unstable landform	Few		
Soil contamination – nitrogen deposition	Moderate		
Insect epidemic (% of forest land impacted)	>40%		

Watershed name	Upper Pat O'Hara Creek	**code**	100700060504
Total watershed acres:	25,070	**Acres on Forest:**	12,040
Indicators:			
Aquatic biota – native vs. non-native species	Non-native replaced native		
Riparian – condition	<80% PFC		
Road – maintenance	Past due and some structure failure possible		
Road – proximity to stream (% road within 300 feet of stream)	10–25%		
Soil contamination – nitrogen deposition	Moderate		
Fire Regime Condition Class – vegetation	Moderate departure		
Insect epidemic (% of forest land impacted)	>40%		

Watershed name	Brooks Lake Creek	**code**	100800010104
Total watershed acres:	23,200	**Acres on Forest:**	23,200
Indicators:			
Water quality	Brooks Lake Lodge algal blooms. Grazing on West Brooks Lake Creek (Falls Creek). Sediment loads from historical activities on other creeks.		
Aquatic habitat – fragmentation (% of stream miles)	>25%		
Riparian – condition	<80% PFC		
Road – open density (mi/sq. mi)	1–2.4		
Road – maintenance	Past due		
Road – proximity to stream (% road within 300 feet of stream)	10–25%		
Roads – on unstable landform	Most		
Insect epidemic (% of forest land impacted)	>40%		

Watershed name	Wind River-Lava Creek	**code**	100800010105
Total watershed acres:	10,800	**Acres on Forest:**	10,000
Indicators:			
Water quality	Brooks Lake Lodge algal blooms. Sediment loads from historical activities on other creeks.		
Aquatic habitat – survey	Some concern with grazing but <5% of reach lengths. Channel modification on private land.		
Riparian – condition	<80% PFC		
Road – open density (mi/sq. mi)	1–2.4		
Road – maintenance	Past due		
Road – proximity to stream (% road within 300 feet of stream)	10–25%		
Roads – on unstable landform	Most		
Soil contamination – nitrogen deposition	Moderate		
Insect epidemic (% of forest land impacted)	>40%		

Watershed name	Wind River-Crooked Creek	**code**	100800010107
Total watershed acres:	14,800	**Acres on Forest:**	5,580
Indicators:			
Water quality	Brooks Lake Lodge algal blooms. Sediment load in Wind River from private land channel modification.		
Aquatic habitat – survey	Channel modification on private land.		
Aquatic biota – native vs. non-native species	Non-native replaced native		
Riparian – condition	<80% PFC		
Road – open density (mi/sq. mi)	1–2.4		
Road – maintenance	Past due and some structure failure possible		
Road – proximity to stream (% road within 300 feet of stream)	10–25%		
Roads – on unstable landform	Most		
Soil contamination – nitrogen deposition	Moderate		
Insect epidemic (% of forest land impacted)	>40%		

Watershed name	West Fork Long Creek	**code**	100800010108
Total watershed acres:	14,700	**Acres on Forest:**	11,400
Indicators:			
Water quality	Sediment loads from historical activities.		
Aquatic habitat – fragmentation (% of stream miles)	>25%		
Aquatic habitat – survey	Historical, but on upward trend.		
Riparian – condition	<80% PFC		
Road – open density (mi/sq. mi)	1–2.4		
Road – maintenance	Past due and some structure failure possible		
Road – proximity to stream (% road within 300 feet of stream)	10–25%		
Roads – on unstable landform	Few		
Soil contamination – nitrogen deposition	Moderate		
Rangeland – condition	At risk		
Insect epidemic (% of forest land impacted)	>40%		

Watershed name	Lower Warm Spring Creek	**code**	100800010112
Total watershed acres:	15,500	**Acres on Forest:**	13,900
Indicators:			
Water quality	Sediment loads from historical activities.		
Aquatic habitat - fragmentation (% of stream miles)	>25%		
Aquatic biota – native vs. non-native species	Non-native replaced native		
Riparian – condition	<80% PFC		
Road – open density (mi/sq. mi)	1–2.4		
Road – maintenance	Past due		
Road – proximity to stream (% road within 300 feet of stream)	10–25%		
Soil contamination – nitrogen deposition	Moderate		
Insect epidemic (% of forest land impacted)	>40%		

Watershed name	Middle Horse Creek-Wind River	**code**	100800010202
Total watershed acres:	20,100	**Acres on Forest:**	19,800
Indicators:			
Water quantity – flow	Burroughs Creek water transmission line diversion.		
Aquatic habitat – fragmentation (% of stream miles)	>25%		
Aquatic biota – native vs. non-native species	Non-native replaced native		
Road – open density (mi/sq. mi)	1–2.4		
Road – maintenance	Past due		
Road – proximity to stream (% road within 300 feet of stream)	>25%		
Roads – on unstable landform	Most		
Insect epidemic (% of forest land impacted)	>40%		

Watershed name	Lower Horse Creek	**code**	100800010203
Total watershed acres:	13,300	**Acres on Forest:**	2,200
Indicators:			
Aquatic biota – native vs. non-native species	Non-native replaced native		
Riparian – condition	<80% PFC		
Road – open density (mi/sq. mi)	>2.4		
Road – maintenance	Past due		
Road – proximity to stream (% road within 300 feet of stream)	>25%		
Roads – on unstable landform	Few		
Soil contamination – nitrogen deposition	Moderate		
Fire Regime Condition Class – vegetation	Moderate departure		
Rangeland – condition	At risk		
Insect epidemic (% of forest land impacted)	20–40%		

Watershed name	Little Horse Creek	**code**	100800010204
Total watershed acres:	11,500	**Acres on Forest:**	3,280
Indicators:			
Aquatic biota – native vs. non-native species	Non-native replaced native		
Riparian – condition	<80% PFC		
Road – proximity to stream (% road within 300 feet of stream)	>25%		
Roads – on unstable landform	Most		
Soil contamination – nitrogen deposition	Moderate		
Fire Regime Condition Class – vegetation	Moderate departure		
Insect epidemic (% of forest land impacted)	>40%		

Watershed name	Tappan Creek	**code**	100800010205
Total watershed acres:	12,000	**Acres on Forest:**	2,140
Indicators:			
Aquatic biota – native vs. non-native species	Non-native replaced native		
Riparian – condition	<80% PFC		
Road – maintenance	Past due		
Road – proximity to stream (% road within 300 feet of stream)	10–25%		
Roads – on unstable landform	Most		
Soil contamination – nitrogen deposition	Moderate		
Insect epidemic (% of forest land impacted)	>40%		

Watershed name	Willow Creek-Little Popo Agie River	**code**	100800030109
Total watershed acres:	18,900	**Acres on Forest:**	2,570
Indicators:			
Aquatic biota – native vs. non-native species	Non-native replaced native		
Riparian – condition	<80% PFC		
Road – open density (mi/sq. mi)	1–2.4		
Road – maintenance	Past due and some structure failure possible		
Road – proximity to stream (% road within 300 feet of stream)	10–25%		
Soil contamination – nitrogen deposition	Moderate		
Fire Regime Condition Class – vegetation	Moderate departure		
Insect epidemic (% of forest land impacted)	>40%		

Watershed name	Middle North Popo Agie River	**code**	100800030202
Total watershed acres:	27,400	**Acres on Forest:**	12,900
Indicators:			
Water quality	Sediment load from historical activities.		
Aquatic biota – native vs. non-native species	Non-native replaced native		
Riparian – condition	<80% PFC		
Road – maintenance	Past due and some structure failure possible		
Road – proximity to stream (% road within 300 feet of stream)	>25%		
Soil contamination – nitrogen deposition	Moderate		
Insect epidemic (% of forest land impacted)	20–40%		

Watershed name	Sand Creek-Popo Agie River	**code**	100800030203
Total watershed acres:	15,700	**Acres on Forest:**	14,500
Indicators:			
Water quality	Sediment load from historical activities.		
Aquatic habitat - fragmentation (% of stream miles)	>25%		
Aquatic biota – native vs. non-native species	Non-native replaced native		
Riparian – condition	<80% PFC		
Road – maintenance	Past due		
Road – proximity to stream (% road within 300 feet of stream)	>25%		
Soil contamination – nitrogen deposition	Moderate		
Insect epidemic (% of forest land impacted)	20–40%		

Watershed name	Lower Middle Popo Agie River	**code**	100800030207
Total watershed acres:	21,500	**Acres on Forest:**	6,780
Indicators:			
Aquatic biota – native vs. non-native species	Non-native replaced native		
Aquatic biota – aquatic invasive species	Whirling disease and didymo		
Road – open density (mi/sq. mi)	1–2.4		
Road – maintenance	Past due		
Road – proximity to stream (% road within 300 feet of stream)	10–25%		
Roads – on unstable landform	Few		
Soils productivity – impacts of invasives	Significant cheat grass establishment		
Soil contamination – nitrogen deposition	Moderate		
Fire Regime Condition Class – vegetation	Moderate departure		
Terrestrial invasive species	Significant cheat grass establishment		
Insect epidemic (% of forest land impacted)	>40%		

Watershed name	Roaring Fork Creek	**code**	100800030208
Total watershed acres:	18,600	**Acres on Forest:**	17,100
Indicators:			
Water quality	Sediment load from historical activities.		
Water quantity – flow	Worthern and Frye Lake flow disruption.		
Aquatic habitat - fragmentation (% of stream miles)	>25%		
Aquatic biota – native vs. non-native species	Non-native replaced native		
Riparian – condition	<80% PFC		
Road – open density (mi/sq. mi)	1–2.4		
Road – maintenance	Past due and some structure failure possible		
Road – proximity to stream (% road within 300 feet of stream)	10–25%		
Soil contamination – nitrogen deposition	Moderate		
Insect epidemic (% of forest land impacted)	>40%		

Appendix H – Watershed Conservation Practices Handbook Design Criteria (Best Management Practices)

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This appendix contains a summary of the management direction that is included in the 2509.25 Watershed Conservation Practices Handbook. The handbook direction is referenced in the Forest Plan and the design criteria in the handbook are incorporated into all project decisions to which they apply. This summary of that direction is attached to the EIS to provide context to the discussion on watershed effects analysis.

Management measures are environmental goals to protect soil, aquatic, and riparian systems. Design criteria are specific practices to attain the management measures using current knowledge and technology. Notes following the design criteria cite the effectiveness of the design criteria. The five areas covered are hydrologic function, riparian areas and wetlands, sediment control, soil quality, and water purity.

A 1985 agreement between the Forest Service and the Environmental Protection Agency mandated the Water Resource Evaluation of Nonpoint Silvicultural Sources (WRENSS) as official guidance to control nonpoint sources of water pollution. Its controls were used to construct many management measures and design criteria. Others are adapted from Federal and State BMPs and work of other Regions and agencies. “Best Management Practices” are, by definition, the most effective, practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals (CDPHE 2001; WY DEQ 2001).

11 - HYDROLOGIC FUNCTION

Hydrologic function is the ability of a watershed to infiltrate precipitation and naturally regulate runoff so streams are in dynamic equilibrium with their channels and floodplains. Management measures and design criteria to protect hydrologic function apply to all actions that may impact the "sponge and filter" qualities of watersheds. Hydrologic function is protected by maintaining good vegetation and ground cover and by minimizing connected disturbed areas.

11.1 - Management Measure (1)

Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased runoff.

1. Design Criteria.

   a. In each watershed containing a 3-rd order and larger stream, limit connected disturbed areas so the total stream network is not expanded by more than 10%. Progress toward zero connected disturbed area as much as practicable. Where it is impossible or impracticable to disconnect a particular connected disturbed area, minimize the areal extent of the individual connected disturbed area as much as practicable. In watersheds that contain stream reaches in diminished stream health class, allow only those actions that will maintain or reduce watershed-scale Connected Disturbed Area.

   b. Design the size, orientation, and surface roughness (that is. slash and other features that would trap and hold snow on site) of forest openings to prevent snow scour and site desiccation.

11.2 - Management Measure (2)

Manage land treatments to maintain enough organic ground cover in each activity area to prevent harmful increased runoff.

1. Design Criteria.

   a. Maintain the organic ground cover of each activity area so that pedestals, rills, and surface runoff from the activity area are not increased. The amount of organic ground cover needed will vary by different ecological types and should be commensurate with the potential of the site.

   b. Restore the organic ground cover of degraded activity areas within the next plan period, using certified local native plants as practicable; avoid persistent or invasive exotic plants.

12 - RIPARIAN AREAS AND WETLANDS

Vegetation next to water bodies plays a major role in sustaining the long-term integrity of aquatic systems (Hynes 1970; Odum 1971). Values provided include shade, bank stability, fish cover, woody debris input, storage and release of sediment, surface-ground water interactions, and habitat for terrestrial and aquatic plants and animals. Riparian zones and wetlands must be managed with care to protect these values.

12.1 - Management Measure (3)

In the water influence zone next to perennial and intermittent streams, lakes, and wetlands, allow only those actions that maintain or improve long-term stream health and riparian ecosystem condition.

1. Design Criteria.

   a. Allow no action that will cause long-term change to a lower stream health class in any stream reach. In degraded systems (that is At-risk or Diminished stream health class), progress toward robust stream health within the next plan period.

   b. Allow no action that will cause long-term change away from desired condition in any riparian or wetland vegetation community. Consider management of stream temperature and large woody debris recruitment when determining desired vegetation community. In degraded systems, progress toward desired condition within the next plan period.

   c. Keep heavy equipment out of streams, swales, and lakes, except to cross at designated points, build crossings, or do restoration work, or if protected by at least 1 foot of packed snow or 2 inches of frozen soil. Keep heavy equipment out of streams during fish spawning, incubation, and emergence periods.

   d. Ensure at least one-end log suspension in the WIZ. Fell trees in a way that protects vegetation in the WIZ from damage. Keep log landings and skid trails out of the WIZ, including swales.

   e. Locate new concentrated-use sites outside the WIZ if practicable and outside riparian areas and wetlands. Armor or reclaim existing sites in the WIZ to prevent detrimental soil and bank erosion.

   f. Manage livestock use through control of time/timing, intensity, and duration/frequency of use in riparian areas and wetlands to maintain or improve long-term stream health. Exclude livestock from riparian areas and wetlands that are not meeting or moving towards desired condition objectives where monitoring information shows continued livestock grazing would prevent attainment of those objectives.

   g. Keep stock tanks, salt supplements, and similar features out of the WIZ if practicable and out of riparian areas and wetlands always. Keep stock driveways out of the WIZ except to cross at designated points. Armor water gaps and designated stock crossings where needed and practicable.

   h. Manage dry meadow and upland plant communities, including Kentucky bluegrass types, that have invaded into wetland/riparian areas in a manner that will contribute to their replacement over time by more mesic native plant communities to the extent practicable. Develop site-specific riparian stubble height standards or use the following default levels for carex and juncos species: 3-4 inches in spring-use pastures and 4-6 inches in summer or autumn use pastures; to leave adequate residual stubble height to retain effective ground cover.

   i. Do not allow livestock grazing through an entire growing season in pastures that contain in riparian areas and wetlands. Apply short-duration grazing as practicable (generally less than

20 days) to minimize re-grazing of individual plants, to provide greater opportunity for regrowth and to manage utilization of woody species and reduce soil compaction. During the hot season (mid-to-late summer) manage livestock herds to avoid concentrating in riparian areas and wetlands. Apply principles of the Grazing Response Index to livestock management (USFS 1996a).

j. Design grazing systems to limit utilization of woody species. Where woody species have been historically suppressed, or where the plant community is below its desired condition and livestock are a key contributing factor, manage livestock through control of time/timing, intensity, and duration/frequency of use so as to allow for riparian hardwood growth extension and reproduction. Manage woody species in riparian areas to provide for stream temperature, bank stability and riparian habitat.

k. Maintain the extent of stable banks in each stream reach at 74% or more of reference conditions. Consider degree of livestock trampling and riparian vegetation utilization on or immediately adjacent to stream banks when timing livestock moves between units.

l. Adjust management in riparian areas and wetlands to improve detrimental soil compaction whenever it occurs.

m. Do not excavate earth material from, or store excavated earth material in, any stream, swale, lake, wetland, or WIZ.

n. Emphasize natural stabilization processes consistent with the stream type and capability (Rosgen and Proper Functioning Condition processes) when restoring damaged stream banks. Use native vegetation for stream bank stabilization whenever practicable.

12.2 - Management Measure (4)

Design and construct all stream crossings and other instream structures to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life.

1. Design Criteria.

a. Install stream crossings to meet Corps of Engineers and State permits, pass normal flows, and be armored to withstand design flows.

b. Size culverts and bridges to pass debris. Engineers work with hydrologists and aquatic biologists on site design.

c. Install stream crossings on straight and resilient stream reaches, as perpendicular to flow as practicable, and to provide passage of fish and other aquatic life.

d. Install stream crossings to sustain bankfull dimensions of width, depth, and slope and keep streambeds and banks resilient. Favor bridges, bottomless arches or buried pipe-arches for those streams with identifiable flood plains and elevated road prisms, instead of pipe culverts. Favor armored fords for those streams where vehicle traffic is either seasonal or temporary, or the ford design maintains the channel pattern, profile and dimension.

e. Install or maintain fish migration barriers only if needed to protect endangered, threatened, sensitive, or unique native aquatic populations, and only where natural barriers do not exist.

12.3 - Management Measure (5)

Conduct actions so that stream pattern, geometry, and habitats maintain or improve long-term stream health.

1. Design Criteria.

a. Add or remove rocks, wood, or other material in streams or lakes only if such action maintains or improves stream and lake health. Leave rocks and portions of wood that are embedded in beds or banks to prevent channel scour and maintain natural habitat complexity.

b. Do not relocate natural stream channels if avoidable. Return flow to natural channels where practicable. Where reconstruction of stream channels is necessary, construct channels and floodways with natural stream pattern and geometry, stable beds and banks and provide habitat complexity.

12.4 - Management Measure (6)

Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function.

1. Design Criteria.

a. Keep ground vehicles out of wetlands unless protected by at least 1 foot of packed snow or 2 inches of frozen soil. Do not disrupt water supply or drainage patterns into wetlands.

b. Keep roads and trails out of wetlands unless there is no other practicable alternative. If roads or trails must enter wetlands, use bridges or raised prisms with diffuse drainage to sustain flow patterns. Set crossing bottoms at natural levels of channel beds and wet meadow surfaces. Avoid actions that may dewater or reduce water budgets in wetlands.

c. Avoid long-term reduction in organic ground cover and organic soil layers in any wetland (including peat in fens).

d. When practicable, keep buried utility and pipelines out of wetlands. If such a line must enter a wetland, use measures that sustain long-term wetland function.

e. Avoid any loss of rare wetlands such as fens and springs.

f. Do not build firelines in or around wetlands unless needed to protect life, property, or wetlands. Use hand lines with minimum feasible soil disturbance. Use wetland features as firelines if practicable.

12.5 - Management Measure (7)

Manage stream flows under appropriate authorities to minimize damage to scenic and aesthetic values, fish and wildlife habitat, and to otherwise protect the environment.

1. Design Criteria.

a. Cooperate with water users and other interested parties to evaluate how to operate existing water use facilities to meet resource goals.

b. Obtain stream flows under appropriate federal and state, legal and regulatory authorities to protect stream processes, aquatic and riparian habitats and communities, and recreation and aesthetic values. Top priority is to protect imperiled native species. Generally, this will include a range of flows to support desired uses and values.

c. Upon issuance of special use authorizations for new or existing water use facilities, include permit conditions at the point of diversion or storage, if needed, to minimize impacts to water dependent resources and values. One or more of the following circumstances may be present in any given project. Water dependent resources and values not included on this list may require additional consideration.

(1) When managing for physical stream processes, including channel maintenance, evaluate each stream on which a project is planned to ascertain what flows represent the amounts and timing needed to sustain these functions. Essential attributes of a properly functioning self-maintaining channel include providing for flows to achieve the following:

(a) Move the mass and sizes of alluvial sediment supplied to the channel.

(b) Maintain channel capacity by preventing terrestrial vegetative growth in the bed of the channel.

(c) Protect and sustain channel banks and the floodplain by maintaining healthy streamside vegetation.

(d) Maintain processes that sustain the relationship between the channel and the floodplain.

(2) When managing for aquatic biota and their habitat, evaluate each stream upon which a project is planned to ascertain what flows represent the amounts and timing needed to sustain viability of existing populations of native and desired non-native vertebrate species**.** Essential flow related attributes of sustainable habitat should achieve the following:

(a) Maintain the physical, biological, and chemical processes necessary for all life-history stages of identified species and communities.

(b) Minimize the impact of dams and diversion structures on the interaction between populations.

(c) Return flows to historic habitat where reintroduction potential exists.

(3) When managing for riparian habitat and communities, evaluate each stream upon which a project is planned to ascertain what flows and timing are needed to maintain or improve riparian habitat and community structure and function. These flows should be adequate to:

(a) Maintain the physical, biological, and chemical processes necessary to ensure the sustainability and ecological integrity of identified species and communities.

(b) Maintain the magnitude, variability, and frequency of disturbance processes that affect community structure and function.

(4) When managing for aesthetic and recreational values, evaluate each stream upon which a project is planned to ascertain what flows and timing represent the amounts and period needed to sustain these values. These flows should be adequate to:

(a) Support flow dependent recreation uses (for example, rafting, kayaking, swimming).

(b) Maintain desired populations of fish species to provide for appropriate recreational experiences.

(c) Provide water for aesthetic enjoyment.

(d) Support special designations, including Wild and Scenic Rivers, where flowing water is critical to the purpose and quality of the designation.

d. Obtain water rights under federal and state law to protect stream processes, aquatic and riparian habitats and communities, and recreation and aesthetic values. Top priority is to protect imperiled native species.

12.6 - Management Measure (8)

Manage water-use facilities to prevent gully erosion of slopes and to prevent sediment and bank damage to streams.

1. Design Criteria.

a. Design all ditches, canals, and pipes with at least an 80% chance of passing high flows and remaining stable during their life.

b. Do not flush or deposit sediment from behind diversion structures into the stream below. Deposit sediment in a designated upland site. Vegetate or otherwise stabilize spoil piles.

c. Mitigate water imports and water disposal (including reservoir releases) so that the extent of stable banks, channel pattern, profile and dimensions maintain or improve long-term stream health in each receiving stream reach.

d. Maintain and operate water conveyance ditches and pipelines to carry their design volumes of water with appropriate freeboard. Keep ditches clear of vegetation, debris or other obstructions to minimize potential for ditch failures.

e. Conduct snow management, including snowmaking and snow-farming, in such a manner that prevents slope failures and gully erosion on the hillslopes and prevents adverse impacts, such as bank erosion and excessive sediment, in receiving streams.

13 - SEDIMENT CONTROL

Most sediment delivered from slopes to streams comes from roads and similar disturbed sites. Management measures and design criteria to control sediment come from Clean Water Act Section 404 mandatory BMPs (33 CFR 323.4), EPA and State BMPs, and WRENSS controls. The goal is antidegradation and no impairment.

13.1 - Management Measure (9)

Limit roads and other disturbed sites to the minimum feasible number, width, and total length consistent with the purpose of specific operations, local topography, and climate.

1. Design Criteria.

   a. Construct roads on ridge tops, stable upper slopes, or wide valley terraces if practicable. Stabilize soils onsite. End-haul soil if full-bench construction is used. Avoid slopes steeper than 70%.

   b. Avoid soil-disturbing actions during periods of heavy rain or wet soils. Apply travel restrictions to protect soil and water.

   c. Install cross drains to disperse runoff into filter strips and minimize connected disturbed areas. Make cuts, fills, and road surfaces strongly resistant to erosion between each stream crossing and at least the nearest cross drain. Revegetate using certified local native plants as practicable; avoid persistent or invasive exotic plants.

   d. Construct roads where practicable, with outslope and rolling grades instead of ditches and culverts.

   e. Retain stabilizing vegetation on unstable soils. Avoid new roads or heavy equipment use on unstable or highly erodible soils.

   f. Use existing roads unless other options will produce less long-term sediment. Reconstruct for long-term soil and drainage stability.

   g. Avoid ground skidding on sustained slopes steeper than 40% and on moderate to severely burned sustained slopes greater than 30%. Conduct logging to disperse runoff as practicable.

   h. Designate, construct, and maintain recreational travelways for proper drainage and armor their stream crossings as needed to control sediment.

   i. During and following operations on outsloped roads, retain drainage and remove berms on the outside edge except those intentionally constructed for protection of road grade fills.

   j. Locate and construct log landings in such a way to minimize the amount of excavation needed and to reduce the potential for soil erosion. Design landings to have proper drainage. After use, treat landings to disperse runoff and prevent surface erosion and encourage revegetation.

13.2 - Management Measure (10)

Construct roads and other disturbed sites to minimize sediment discharge into streams, lakes, and wetlands.

1. Design Criteria.

   a. Design all roads, trails, and other soil disturbances to the minimum standard for their use and to "roll" with the terrain as feasible.

   b. Use filter strips, and sediment traps if needed, to keep all sand-sized sediment on the land and disconnect disturbed soil from streams, lakes, and wetlands. Disperse runoff into filter strips.

   c. Key sediment traps into the ground. Clean them out when 50% full. Remove sediment to a stable, gentle, upland site and revegetate.

   d. Keep heavy equipment out of filter strips except to do restoration work or build armored stream or lake approaches. Yard logs up out of each filter strip with minimum disturbance of ground cover.

   e. Build firelines outside filter strips unless tied into a stream, lake, or wetland as a firebreak with minimal disturbed soil. Retain organic ground cover in filter strips during prescribed fires.

   f. Design road ditches and cross drains to limit flow to ditch capacity and prevent ditch erosion and failure.

13.3 - Management Measure (11)

Stabilize and maintain roads and other disturbed sites during and after construction to control erosion.

1. Design Criteria.

   a. Do not encroach fills or introduce soil into streams, swales, lakes, or wetlands.

   b. Properly compact fills and keep woody debris out of them. Revegetate cuts and fills upon final shaping to restore ground cover, using certified local native plants as practicable; avoid persistent or invasive exotic plants. Provide sediment control until erosion control is permanent.

   c. Do not disturb ditches during maintenance unless needed to restore drainage capacity or repair damage. Do not undercut the cut slope.

   d. Space cross drains according to road grade and soil type as indicated below: (ex. 01). Do not divert water from one stream to another.

   e. Empty cross drains onto stable slopes that disperse runoff into filter strips. On soils that may gully, armor outlets to disperse runoff. Tighten cross-drain spacing so gullies are not created.

f. Armor rolling dips as needed to prevent rutting damage to the function of the rolling dips. Ensure that road maintenance provides stable surfaces and drainage.

g. Where berms must be used, construct and maintain them to protect the road surface, drainage features, and slope integrity while also providing user safety.

h. Build firelines with rolling grades and minimum downhill convergence. Outslope or backblade, permanently drain, and revegetate firelines immediately after the burn. Use certified local native plants as practicable; avoid persistent or invasive exotic plants.

i. Use the minimum amount of sand, salt, and/or other de-icing substances (Mag-Chloride) as necessary to provide safe winter travel conditions. Design paved roads and parking lots to facilitate sand removal (that is curbs or paved ditches). Use filter strips or other trapping methods to reduce movement of de-icing materials into near-by water bodies. Do not deposit sediment into streams or on streambanks along roads.

j. During winter operations, maintain roads as needed to keep the road surface drained during thaws and break-ups. Perform snow removal in such a manner that protects the road and other adjacent resources. Do not use riparian areas, wetlands or streams for snow storage or disposal. Remove snow berms where they result in accumulation or concentration of snowmelt runoff on the road or erodible fill slopes. Install snow berms where such placement will preclude concentration of snowmelt runoff and will serve to rapidly dissipate melt water.

k. On roads with high/heavy traffic use, require maintenance agreements and/or use of road surface stabilization practices and dust abatement supplements. See FSH 7709.56 and FSH 7709.58.

13.4 - Management Measure (12)

Reclaim roads and other disturbed sites when use ends, as needed, to prevent resource damage.

1. Design Criteria.

a. Site-prepare, drain, decompact, revegetate, and close temporary and intermittent use roads and other disturbed sites within one year after use ends. Provide stable drainage that disperses runoff into filter strips and maintains stable fills. Do this work concurrently. Stockpile topsoil where practicable to be used in site restoration. Use certified local native plants as practicable; avoid persistent or invasive exotic plants.

b. Remove all temporary stream crossings (including all fill material in the active channel), restore the channel geometry, and revegetate the channel banks using certified local native plants as practicable; avoid persistent or invasive exotic plants.

c. Restore cuts and fills to the original slope contours where practicable and as opportunities arise to re-establish subsurface pathways. Use certified local native plants as practicable; avoid persistent or invasive exotic plants. Obtain stormwater (402) discharge permits as required.

d. Establish effective ground cover on disturbed sites to prevent accelerated on-site soil loss and sediment delivery to streams. Restore ground cover using certified native plants as practicable to meet revegetation objectives. Avoid persistent or invasive exotic plants.

14 - SOIL QUALITY

Soil quality determines vegetation growth capability in all terrestrial ecosystems. Soil depth, structure, organic matter, and nutrients are critical to sustaining this potential. Management measures and design criteria to protect soil quality apply to all actions that may impact these soil qualities.

14.1 - Management Measure (13)

Manage land treatments to limit the sum of severely burned soil and detrimentally compacted, eroded, and displaced soil to no more than 15% of any activity area.

1. Design Criteria.

    a. Restrict roads, landings, skid trails, concentrated-use sites, and similar soil disturbances to designated sites.

    b. Operate heavy equipment for land treatments only when soil moisture is below the plastic limit, or protected by at least 1 foot of packed snow or 2 inches of frozen soil.

    c. Conduct prescribed fires to minimize the residence time on the soil while meeting the burn objectives. This is usually done when the soil and duff are moist.

    d. Allow dispersed winter motorized recreation when snow depths are sufficient to protect soils. Specify a minimum unpacked snow depth of 12 inches unless a site-specific analysis shows a different snow depth is adequate to protect soils. Allow use of snowcats or grooming machines when unpacked snow depths equal or exceed 18 inches. Evaluate special use permit conditions on a site specific basis.

14.2 - Management Measure (14)

Maintain or improve long-term levels of organic matter and nutrients on all lands.

1. Design Criteria.

    a. On soils with surface soil (A-horizon) thinner than 1 inch, topsoil organic matter less than 2%, or effective rooting depth less than 15 inches, retain 80 - 90% of the fine (less than 3 inches in diameter) post treatment logging slash in the stand after each clearcut and seed-tree harvest. Consider need for retention of coarse woody debris slash in each activity area to balance soil quality requirements and fuel loading concerns.

    b. If machine piling of slash is done, conduct piling to leave topsoil in place and to avoid displacing soil into piles or windrows.

15 - WATER PURITY

Chemicals and pathogens impact water purity. Management measures and design criteria to protect water purity intend to avoid contamination of all waters.

15.1 - Management Measure (15)

Place new sources of chemical and pathogenic pollutants where such pollutants will not reach surface or ground water.

1. Design Criteria.

   a. Locate pack and riding stock sites (for example corrals and loading areas), sanitary sites, and well drill-pads outside the water influence zone (WIZ).

   b. Locate vehicle service and fuel areas, chemical storage and use areas, and waste dumps and areas on gentle upland sites. Mix, load, and clean on gentle upland sites. Dispose of chemicals and containers in State-certified disposal areas.

   c. Locate temporary labor, spike, logging and fire camps such that surface and subsurface water resources are protected. Consideration should be given to disposal of human waste, wastewater and garbage and other solid wastes.

15.2 - Management Measure (16)

Apply runoff controls to disconnect new pollutant sources from surface and ground water.

1. Design Criteria.

   a. Install contour berms and trenches around vehicle service and refueling areas, chemical storage and use areas, and waste dumps to fully contain spills. Use liners as needed to prevent seepage to ground water. Prepare Spill Prevention Control and Countermeasure Plan per the requirements of 40 CFR 112.

   b. Reclaim each mine waste dump when its use ends, using certified local native plants as practicable; avoid persistent or invasive exotic plants. Stabilize waste dumps and tailings in non-use periods to prevent wind and water erosion. If non-use will exceed one year, perform concurrent reclamation. Require removal or encapsulation of waste material as necessary to prevent contamination of nearby water bodies before operator abandons site or reclamation is accepted as final.

   c. Prevent contaminated runoff from waste dumps and/or tailings from reaching surface and/or ground water. Potential techniques include use of lined ponds to catch runoff, diversion ditches or other runoff controls to divert runoff around waste dumps/tailings piles, capping or treating waste piles on site or off-site disposal of waste as appropriate. If ponds are used, build tailings dams with a 95% chance of containing floods (100-year event) over their design life. Permanently stabilize dams at final shaping.

   d. Clean wastewater from concrete batching and aggregate operations before returning the water to streams, lakes, or wetlands.

   e. Inspect equipment used for transportation, storage or application of chemicals daily during use period for leaks. If leaks or spills occur, report them and install emergency traps to contain them and clean them up. Refer to FSH 6709.11, chapter 60 for direction on working with hazardous materials.

f. Report spills and take appropriate clean-up action in accordance with applicable state and federal laws, rules and regulations. Contaminated soil and other material shall be removed from NFS lands and disposed of in a manner according to state and federal laws, rules and regulations.

15.3 - Management Measure (17)

Apply chemicals using methods that minimize risk of entry to surface and ground water.

1. Design Criteria.

a. Favor pesticides with half-lives of 3 months or less when practicable to achieve treatment objectives.. Apply at lowest effective rates as large droplets or pellets. Follow the label directions. Favor selective treatment. Use only aquatic-labeled chemicals in the WIZ.

b. Use non-toxic, non-hazardous drilling fluids when practicable.